Ministry of Higher Education and Scientific Research
Scientific Supervision and Evaluation Authority
Quality Assurance and Academic Accreditation Department
International Accreditation Department

Academic Program and Course Description Guide

2025

Introduction

The academic program is a coordinated and organized package of courses that include procedures and experiences organized in the form of study vocabulary, the main purpose of which is to build and refine the skills of graduates, which makes them qualified to meet the requirements of the labor market. It is reviewed and evaluated annually through internal or external audit procedures and programs, such as the external examiner program. The academic program description provides a brief summary of the main features of the program and its courses, indicating the skills that students are working to acquire based on the objectives of the academic program. The importance of this description is evident in that it represents the cornerstone in obtaining program accreditation and participates in writing the teaching materials under the supervision of the scientific committees in the scientific departments. This guide, in its second version, includes a description of the academic programs after updating the vocabulary and paragraphs of the previous guide in light of the developments and changes in the educational system in Iraq, which included a description of the academic program in its traditional form (annual, semester) system, in addition to adopting the description of the academic program circulated under the letter of the Department of Studies No. 2906/3 dated 5/3/2023 regarding the program for its work. In this field, we seek to emphasize the importance of writing a description of the academic program and courses to ensure the smooth running of the educational process.

Concepts and Terms

1. Academic Program Description: The academic program description provides a comprehensive overview of the program's vision, mission, objectives, and educational outcomes. This description serves as a strategic reference for achieving academic development, and accurately identifies how the program will be implemented to effectively achieve its objectives.

2. Course Description: Provides a brief and accurate description of each course, including its objectives and expected outcomes. The description should include clear details on how to make the most of the offered course material, and whether the student has acquired the required skills and knowledge.

3. Program Vision: The vision expresses the program's future aspirations. The program seeks to be a pioneer and distinguished locally and internationally, with a focus on innovation and quality in education, and achieving sustainability in providing educational programs that are in line with the needs of society and the labor market.

4. Program Mission: The mission clarifies the general objectives that the program seeks to achieve through education and learning. The mission includes an outline of how to develop students' capabilities and prepare them for the labor market in innovative and modern ways that are in line with technological and cognitive changes.

5. Program Objectives: A set of specific objectives that the program seeks to achieve over a specific period of time. These objectives include developing the student's knowledge and skills in measurable and evaluable ways, which contributes to improving the quality of the educational process and achieving distinguished educational outcomes.

6. Curriculum: The curriculum includes all the courses offered by the program, whether theoretical or practical. The plan is integrated with the educational strategies used, and takes into account the number of study hours for each course to ensure a balance between theoretical and applied content.

7. Learning Outcomes: Learning outcomes represent a set of skills and knowledge that the student must acquire by the end of the academic program successfully. These outcomes are determined based on the program objectives, and are an important tool for evaluating the effectiveness of education and ensuring the achievement of high-quality educational outcomes.

8. Teaching and Learning Strategies: These are the strategies used by the faculty to ensure the achievement of the educational objectives of the program. These strategies include the use of various methods in education such as interactive learning, e-learning, in addition to classroom and extracurricular activities that contribute to enhancing a deep understanding of the educational content and achieving the required learning outcomes.

Conclusion By preparing this comprehensive academic description, we hope that the program will be able to meet the highest standards of academic quality, and will contribute effectively to improving educational outcomes and developing student skills in line with the requirements of the modern labor market. Through this guide, we aspire to raise the level of academic education and contribute to enhancing the university's position locally and internationally.

Academic Program Description Form

College/Institute: Polytechnic Hawija College

Scientific Department: Department of Robotics Engineering Techniques and Artificial Intelligence

Academic or Professional Program Name:
Department of Robotics Engineering Techniques and Artificial Intelligence

Final Certificate Name: Department of Robotics Engineering Techniques and Artificial Intelligence

Study System: Courses

Description Preparation Date: 2025-9-24

File Completion Date: 2025-9-24

Signature:
Name of Head of Department:

Assist. Prof. Raed Abdulkarim Hassan
Date: 2025-9-24

Signature:
Name of Head of Department:

Assist. Prof. Dr. Mohammed Ali Fares
Date: 2025-9-24

File Reviewed by:

Quality Assurance and University Performance Division

Name of Director of the Quality Assurance and University Performance Division:
M. M. Ahmed Abdul Khalaf
Date: 2025-9-24
Signature:

Approval of the Dean:

1- vision The program

To become a leading department in technical education and scientific research in the fields of power mechanics, power generation, and modern automotive technologies, based on the needs and requirements of society and relevant service institutions, while keeping pace with the latest technological advancements at the local and regional levels.

2- Message The program

To prepare specialized technical professionals equipped with modern knowledge and skills in the fields of power generation and modern automotive technologies through an outstanding educational environment, up-to-date curricula, and advanced laboratories, while contributing effectively to the industrial and service sectors and upholding professional and ethical values.

2- Goals The program

1. Academic Excellence

- Develop curricula and study plans in line with the latest industrial and technological advancements in the fields of **power generation** and **modern automotive technologies**.
- Adopt modern teaching methods that integrate theoretical knowledge with practical application.
- Prepare highly qualified graduates equipped with the competencies required to meet the demands of the labor market in the fields of power generation and modern automotive technologies.

2. Practical Training and Scientific Research

- Enhance students' technical skills through practical training in the department's laboratories and specialized workshops.
- Encourage applied scientific research that contributes to the development of power generation plants and modern automotive systems.
- Promote research in the field of sustainable development to achieve greater environmental sustainability

3. Community Service

- Provide technical and consultancy services to the community by offering vehicle inspection and maintenance services and contributing to improving the efficiency of power generation systems in local institutions.
- Raise environmental and technical awareness through awareness campaigns and workshops on the importance of vehicle maintenance and the safe use of energy.
- Contribute to applied projects that serve the environment and society, such as developing vehicle fault detection devices and improving power generation plant systems.

4. Professional Development

- Enhance the capabilities of academic and technical staff by involving them in specialized training programs on the latest technologies in modern automotive systems and power generation plants.
- Strengthen the expertise of faculty members and technical personnel through participation in conferences, workshops, and specialized training courses.
- Align the department's professional development activities with labor market needs to ensure that students' skills meet the requirements of power generation institutions and modern automotive companies.

5. Effective Leadership and Management

- Adopt the principles of good governance in academic administration to achieve the department's vision and strategic objectives.
- Empower effective academic leadership and enhance institutional performance in accordance with modern quality standards.
- Foster a culture of teamwork and collaboration to create a motivating and productive work environment.

6. Collaboration and Openness

- Participate in local and international conferences and forums while expanding horizons for scientific and academic cooperation.
- Establish collaborative partnerships with government institutions and the private sector.
- Promote the exchange of expertise and knowledge with academic and technical institutions.

4- Accreditation Programmatic
no There is

5- Effects Foreign Affairs Other
• The Iraqi labor market and regional markets require qualified technical professionals in fields such as the operation and maintenance of power systems, as well as the management of industrial workshops, refrigeration and air-conditioning systems, and thermal energy systems. • Employers increasingly seek graduates who possess advanced practical and applied skills. • The government's orientation toward renewable energy and energy conservation requires the integration of modern courses and technologies into the academic program. • The Ministry of Higher Education's plans to enhance quality assurance and achieve program accreditation necessitate the continuous development of academic programs. • Collaboration with factories, industrial plants, and the private sector provides valuable practical training opportunities for students and enriches the academic program. • Joint contracts and partnership agreements with productive institutions contribute to the development of students' practical and technical skills.

6- Program structure

Program structure	Number of courses	Study unit	percentage	comments
University requirements	11	22	26.8%	9 Essential, 2 Elective (non-Essential)
College requirements	4	9	9.8%	3 Essential, 1 Elective (non-Essential)
Department requirements	22	86	%63.4	22 Essential
Compliant and non-compliant	The student starts 1/7 and ends 1/9 in the first level			

7- program structure

Courses for the two branches:

1- Power Generation techniques/ **first year**

Seq	Subject	Theoretical (hours)	Practical (Hours)	Total (Hours)	Units	Notes
Study plan: first level /first semester	Human Rights and Democracy	**2**	**0**	**2**	**2**	Compulsory
	English Language	**2**	**0**	**2**	**2**	Compulsory
	Mathematic 1	**2**	**0**	**2**	**2**	Compulsory
	Mechanical Workshops1	**0**	**3**	**3**	**3**	Compulsory
	Thermodynamics	**2**	**2**	**4**	**4**	Compulsory
	Electrical technology1	**2**	**2**	**4**	**4**	Compulsory
	Fluid	**2**	**2**	**4**	**4**	Compulsory
	Engineering Mechanics1	**2**	**2**	**4**	**4**	Compulsory
	Engineering Drawing1	**0**	**3**	**3**	**3**	Compulsory
Study plan: first level /second semester	Computer	1	1	2	2	Compulsory
	Arabic Language	2	0	2	2	Compulsory
	Mathematic 2	2	0	2	2	Compulsory
	Mechanical Workshops 2	0	3	3	3	Compulsory
	Heat Transfer	**2**	**2**	**4**	**4**	Compulsory
	Engineering Drawing 2	**0**	**3**	**3**	**3**	Compulsory
	Hydraulic Machines	**2**	**2**	**4**	**4**	Compulsory
	Electrical technology2	**2**	**2**	**4**	**4**	Compulsory
	Engineering Mechanics2	**2**	**2**	**4**	**4**	Compulsory

Power Generation techniques/ **Second year**

Seq	Subject	Hours			Units	Notes
		Theo.	Prac.	T		
Study plan: second level /first semester	English Language 2	**2**	**0**	**2**	**2**	Compulsory
	Ethics of the Profession	**2**	**0**	**2**	**2**	Compulsory
	The crimes of the Baath regime in Iraq	**2**	**0**	**2**	**2**	Compulsory
	Measurement Instruments1	**2**	**2**	**4**	**4**	Compulsory
	Hydraulic & Pneumatic Systems1	**2**	**2**	**4**	**4**	Compulsory
	Gas Turbine and Diesel Power Plant Technology1	**2**	**3**	**5**	**5**	Compulsory
	Steam Power Plant Technology1	**2**	**3**	**5**	**5**	Compulsory
	Electrical Technology1	**2**	**2**	**4**	**4**	Compulsory
	Industrial Drawing	**0**	**3**	**3**	**3**	Compulsory
Study plan: second level /second semester	Arabic language	**2**	**0**	**2**	**2**	Compulsory
	Computer	**1**	**1**	**2**	**2**	Compulsory
	Measurement Instruments2	**2**	**2**	**4**	**4**	Compulsory
	Hydraulic & Pneumatic Systems2	**2**	**2**	**4**	**4**	Compulsory
	Gas Turbine and Diesel Power Plant Technology2	**2**	**3**	**5**	**5**	Compulsory
	Steam Power Plant Technology2	**2**	**3**	**5**	**5**	Compulsory
	Electrical technology	**2**	**2**	**4**	**4**	Compulsory
	Project	**0**	**3**	**3**	**3**	Compulsory

2. Automobile techniques/ **first year**

Seq	Subject	The. (hours)	Pra. (hours)	Total	Units	Notes
Study plan: first level /first semester	Human Rights and Democracy	**2**	**0**	**2**	**2**	Compulsory
	English Language	**2**	**0**	**2**	**2**	Compulsory
	Mathematic 1	**2**	**0**	**2**	**2**	Compulsory
	Mechanical Workshops	**0**	**3**	**3**	**3**	Compulsory
	Thermodynamics	**2**	**2**	**4**	**4**	Compulsory
	Automotive Engines Maintenance1	**2**	**4**	**6**	**6**	Compulsory
	Automotive Electrics and Electronics1	**2**	**2**	**4**	**4**	Compulsory
	Engineering Mechanics	**2**	**1**	**3**	**3**	Compulsory
	Engineering Drawing1	**0**	**3**	**3**	**3**	Compulsory
Study plan: first level /second semester	Arabic Language	**2**	**0**	**2**	**2**	Compulsory
	Computer	**1**	**1**	**2**	**2**	Compulsory
	Mathematic 2	**2**	**0**	**2**	**2**	Compulsory
	Workshops 2	**0**	**3**	**3**	**3**	Compulsory
	Heat Transfer and Fluid	**1**	**2**	**3**	**3**	Compulsory
	Automotive Engines Maintenance2	**2**	**4**	**6**	**6**	Compulsory
	Automotive Electrics and Electronics 2	**2**	**2**	**4**	**4**	Compulsory
	Engineering Drawing2	**0**	**3**	**3**	**3**	Compulsory

Automobile Techniques/ **Second Year**

Seq	Subject	Hours			Units	Type
		Theo.	practical	Total		
Study plan: second level /first semester	English Language 2	2	0	2	2	Compulsory
	Ethics of the Profession	2	0	2	2	Compulsory
	The crimes of the Baath regime in Iraq	2	0	2	2	Compulsory
	Maintenance of automotive mechanical power transmission systems1	2	4	6	6	Compulsory
	Automotive electronic control systems1	2	2	4	4	Compulsory
	Internal Composition Engine1	2	2	4	4	Compulsory
	Computer Aided Engineering Drawing For Automotive Parts	0	6	6	6	Compulsory
	Automotive Bodywork1	1	2	3	3	Compulsory
	Automotive Electrical and electronics1	1	2	3	3	Compulsory
Study plan: second level /second semester	Arabic language	2	0	2	2	Compulsory
	Computer	1	1	2	2	Compulsory
	Maintenance brake, suspension and steering systems in the Automotive2	2	4	6	6	Compulsory
	Automotive electronic control systems2	2	2	4	4	Compulsory
	Internal Composition Engine2	2	2	4	4	Compulsory
	Automotive mechanics	4	0	4	4	Compulsory
	Automotive Bodywork2	1	2	3	3	Compulsory
	Automotive Electrical and electronics2	1	2	3	3	Compulsory
	Project	0	3	3	3	Compulsory

8- Expected Program Learning Outcomes

Cognitive Objectives:

1.Acquire knowledge of the operating principles of the components and systems of both diesel and gasoline vehicles.

1. Acquire knowledge of vehicle fault diagnosis and troubleshooting.
2. Acquire knowledge of fault diagnosis in electrical power generation plants.
3. Acquire knowledge of the procedures for carrying out routine maintenance of equipment, systems, and machinery at work sites.
4. Effectively transfer the above-mentioned theoretical knowledge to skilled technicians in the workplace.

Skills

Program-Specific Skill Objectives:

1. Develop the ability to maintain and repair the components and systems of both **diesel and gasoline vehicles**.
2. Develop the ability to maintain and repair the components and systems of **electrical power generation plants and power generation systems**.
3. Develop the ability to operate **electrical power generation plants** and **water pumping stations**.

Values

1. Enhance students' awareness and responsibility throughout the learning process.
2. Encourage students to actively participate in classroom activities and submit assignments on time.
3. Adhere to occupational health and safety regulations while working in laboratories.
4. Develop students' concentration and selective attention skills.
5. Strengthen students' self-confidence.
6. Promote effective time management and discourage wasting time.
7. Foster a spirit of competition, motivation, and enthusiasm among students.

9- Teaching and Learning Strategies

- Lectures, workshops, laboratories, structured practical training, summer training, as well as scientific field visits to various electrical power generation plants.

1. Explanation and clarification through lectures.
2. Practical instruction in workshops and laboratories.
3. Report writing and assessment.
4. Students' graduation projects.
5. Summer training.
6. Structured practical training.
7. Seminars and discussion sessions.
8. Guidance and awareness seminars.

10- Assessment Methods

1. Theoretical examinations (oral and written).
2. Practical examinations.
3. Midterm and final examinations.
4. Continuous (daily) assessment.
5. Report evaluation.
6. Assigning homework and requiring students to solve specific problems.

11- Faculty

Faculty members

Academic rank	Specialization		Special requirements skills (if any)		Faculty Preparation	
	general	private			angel	lecturer
Lecturer	Automotive Engineering Technology	Operation of Machines, Transportation Systems, and Technology			angel	
Lecturer	Automotive Engineering Technology	Machinery and Equipment Technology			angel	
Assistant Lecturer	Mechanical Engineering	Solar Energy			angel	
Assistant Lecturer	Mechanical Engineering	Energy			angel	

12- Professional development

Orientation of new faculty members

1. Training courses in the field of **Power Mechanics Techniques.**
2. Specialized courses on scientific research publication and the preparation of applied and field research.
3. Effective use of modern information resources, including library resources and the Internet.
4. Participation in training courses and professional development programs both inside and outside the institute.
5. Preparation and development of educational packages (teaching materials).
6. Cooperation with government and private sector institutions in the areas of training, supervision, and consultancy.

Professional Development of Faculty Members

1. Update and revise the approved curricula in line with recent scientific and technological developments.
2. Utilize modern information resources, including library resources and the Internet.
3. Participate in training courses and professional development programs both inside and outside the institute.
4. Provide technical and administrative consultation services.
5. Conduct applied and field research.
6. Prepare and develop educational packages (teaching materials).
7. Cooperate with government and private sector institutions in the areas of training, supervision, and consultancy.

13- Admission Criteria

- Admission is based on the student's final average according to the **Central Admission System** of the **Ministry of Higher Education and Scientific Research**.
- The student's secondary school branch, which includes:

  A. Scientific Branch

  B. Vocational (Industrial) Branch

- A personal interview conducted by a committee formed from the department's faculty members to assess applicants.
- Medical examination for students.

14- Main Sources of Information about the Program

- Prescribed textbooks approved by **Northern Technical University**.
- Resources available in the college library or accessible through the Internet.

15- Program Development Plan

1. Curriculum and Academic Program Development

- Update the curriculum in line with recent advancements in **power generation technologies** and **modern automotive technologies**.
- Align the program learning outcomes with labor market requirements and accredited academic standards.
- Strengthen the integration of theoretical knowledge and practical application within the curriculum.

2. Enhancing Practical Training and Scientific Research

- Expand practical training programs in laboratories and specialized workshops.
- Link graduation projects and research activities to real industrial challenges.
- Encourage applied research in the fields of **sustainable energy** and **mechanical systems efficiency**.

3. Student Skills Development

- Develop students' technical and professional skills.
- Enhance students' problem-solving, teamwork, and communication skills.
- Prepare graduates who are capable of competing in the **power generation** and **automotive industries**.

4. Community Engagement and Labor Market Partnership

- Establish partnerships with government institutions and the private sector.
- Involve employers in reviewing and developing the curriculum.
- Provide consultancy and applied technical services to strengthen the department's role in community service.

5. Professional Development of Staff

- Encourage faculty members and technical staff to participate in specialized training courses and conferences.
- Continuously update staff competencies in line with emerging technologies.
- Promote a culture of continuous learning and institutional development.

6. Governance and Quality Assurance

- Apply the principles of good governance in implementing the program development plan.
- Adopt continuous evaluation and quality improvement mechanisms for the academic program.
- Monitor key performance indicators to ensure the achievement of the program objectives and the department's vision.

Program Skills Map

Program Skills Matrix / Power Generation techniques/ first year

year/ Level	Course Code	Course Title	Compulsory or Optional	Required Program Learning Outcomes											
				Knowledge				Skills				Values			
				A1	**A2**	**A3**	**A4**	**B1**	**B2**	**B3**	**B4**	**C1**	**C2**	**C3**	**C4**
The **first** level of the two semesters	NTU100	Human Rights and Democracy	Compulsory									√	√	√	√
	NTU101	English language	Compulsory								√			√	√
	TIH110	Mathematic 1	Compulsory	√	√	√	√			√	√				
	TIH113	Mechanical Workshops	Compulsory					√	√	√	√		√		
	MPTP122	Thermodynamics	Compulsory	√	√	√	√			√	√				
	MPTP121	Electrical technology1	Compulsory	√	√	√		√	√	√					
	MPTP120	Fluid	Compulsory	√	√	√	√			√	√				
	MPTP127	Engineering Mechanics1	Compulsory	√	√	√	√			√	√				
	MPTP125	Engineering Drawing1	Compulsory		√	√		√	√	√					

	NTU103	Arabic language	Compulsory								√			√	√
	NTU102	Computer	Compulsory					√	√	√	√		√		
	TIH111	Mathematic 2	Compulsory	√	√	√	√			√	√				
	TIH114	Mechanical Workshops 2	Compulsory					√	√	√	√		√		
	MPTP123	Heat Transfer	Compulsory	√	√	√	√			√	√				
	MPTP126	Engineering Drawing2	Compulsory		√	√		√	√	√					
	MPTP128	Hydraulic Machines	Compulsory		√	√		√	√	√					
	MPTP124	Electrical technology2	Compulsory	√	√	√		√	√	√					
	MPTP129	Engineering Mechanics2	Compulsory	√	√	√	√			√	√				

Program Skills Matrix / Power Generation techniques/ Second year

year/ Level	Course Code	Course Title	Compulsory or Optional	Required Program Learning Outcomes											
				Knowledge				Skills				Values			
				A1	**A2**	**A3**	**A4**	**B1**	**B2**	**B3**	**B4**	**C1**	**C2**	**C3**	**C4**
The **Second** level of the two semesters	NTU200	English language	Compulsory								√			√	√
	NTU204	Ethics of the Profession	Compulsory									√	√	√	√
	NTU203	The crimes of the Baath regime in Iraq	Compulsory									√	√	√	√
	MPTP220	Measurement Instruments1	Compulsory		√	√		√	√	√					
	MPTP221	Hydraulic & Pneumatic Systems1	Compulsory		√	√		√	√	√					
	MPTP222	Gas Turbine and Diesel Power Plant Technology1	Compulsory	√	√	√	√	√		√			√	√	
	MPTP223	Steam Power Plant Technology1	Compulsory	√	√	√	√	√		√			√	√	
	MPTP224	Electrical Technology1	Compulsory	√	√	√		√	√	√					
	MPTP225	Industrial Drawing	Compulsory		√	√		√	√	√					
	NTU202	Arabic language	Compulsory								√			√	√
	NTU201	Computer	Compulsory					√	√	√	√		√		

	MPTP228	Measurement Instruments 2	Compulsory		√	√		√	√	√					
	MPTP229	Hydraulic & Pneumatic Systems2	Compulsory		√	√		√	√	√					
	MPTP231	Gas Turbine and Diesel Power Plant Technology2	Compulsory	√	√	√	√	√		√			√	√	
	MPTP232	Steam Power Plant Technology2	Compulsory	√	√	√	√	√		√			√	√	
	MPTP230	Electrical Technology2	Compulsory	√	√	√		√	√	√					
	MPTP234	Graduation Project	Compulsory	√	√			√	√	√	√	√	√	√	√

Program Skills Matrix / Automobile techniques/ first year

year/ Level	Course Code	Course Title	Compulsory or Optional	Required Program Learning Outcomes											
				Knowledge				Skills				Values			
				A1	**A2**	**A3**	**A4**	**B1**	**B2**	**B3**	**B4**	**C1**	**C2**	**C3**	**C4**
The **first** level of the two semesters	NTU100	Human Rights and Democracy	Compulsory									√	√	√	√
	NTU101	English language	Compulsory								√			√	√
	TIH110	Mathematic 1	Compulsory	√	√	√	√			√	√				
	TIH112	Workshops1	Compulsory					√	√	√	√		√		
	PMTA124	Thermodynamics	Compulsory	√	√	√	√			√	√				
	PMTA120	Automotive Engines Maintenance1	Compulsory		√	√		√	√	√	√		√		
	PMTA122	Fundamentals of Automotive Electrics and Electronics 1	Compulsory			√	√		√	√	√				
	PMTA126	Engineering Mechanics	Compulsory	√	√	√	√			√	√				
	PMTA127	Engineering Drawing1	Compulsory		√	√		√	√	√					

	NTU103	Arabic language	Compulsory								√			√	√
	NTU102	Computer	Compulsory					√	√	√	√		√		
	TIH111	Mathematic 2	Compulsory	√	√	√	√			√	√				
	TIH113	Workshops 2	Compulsory					√	√	√	√		√		
	PMTA125	Heat Transfer and Fluid	Compulsory	√	√	√	√			√	√				
	PMTA121	Automotive Engines Maintenance 2	Compulsory		√	√		√	√	√	√		√		
	PMTA123	Fundamentals of Automotive Electrics and Electronics 2	Compulsory			√	√		√	√	√				
	PMTA128	Engineering Drawing 2	Compulsory		√	√		√	√	√					

Program Skills Matrix / Automobile techniques / Second year

year/ Level	Course Code	Course Title	Compulsory or Optional	Required Program Learning Outcomes											
				Knowledge				Skills				Values			
				A1	**A2**	**A3**	**A4**	**B1**	**B2**	**B3**	**B4**	**C1**	**C2**	**C3**	**C4**
The **Second** level of the two semesters	NTU200	English language	Compulsory								√			√	√
	NTU204	Ethics of the Profession	Compulsory									√	√	√	√
	NTU203	The crimes of the Baath regime in Iraq	Compulsory									√	√	√	√
	PMTA210	Maintenance of automotive mechanical power transmission systems1	Compulsory		√	√		√	√	√	√		√		
	PMTA212	Automotive electronic control systems1	Compulsory			√	√		√	√	√				
	PMTA214	Internal Composition Engine1	Compulsory		√	√		√	√	√	√		√		
	PMTA219	computer aided Engineering drawing for automotive parts	Compulsory		√	√		√	√	√					
	PMTA217	Automotive Bodywork1	Compulsory		√	√		√	√	√	√		√		

	PMTA228	Automotive Electrical and electronics1	Compulsory			√	√		√	√	√				
	NTU202	Arabic language	Compulsory								√			√	√
	NTU201	Computer	Compulsory					√	√	√	√		√		
	PMTA224	Maintenance brake, suspension and steering systems in the Automotive2	Compulsory		√	√		√	√	√	√		√		
	PMTA213	Automotive electronic control systems2	Compulsory			√	√		√	√	√				
	PMTA215	Internal Composition Engine2	Compulsory		√	√		√	√	√	√		√		
	PMTA223	Automotive mechanics	Compulsory	√	√	√	√			√	√				
	PMTA218	Automotive Bodywork2	Compulsory		√	√		√	√	√	√		√		
	PMTA229	Automotive Electrical and electronics2	Compulsory			√	√		√	√	√				
	PMTA226	Project Graduation	Compulsory	√	√			√	√	√	√	√	√	√	√

Course Description: **Computer**

1. Course name	Computer
2. code	NTU 102
3. Available attendance forms	My presence
4. Semester/year	First year / first semester
5. Date this description was prepared	5/5/2026
6. Number of study hours (total)	30 hours / Units 2
7. Course Instructor Name	Lecturer / Jasim Ibrahim Musa jasim_hwj@ntu.edu.iq

8. Course objectives

- **Developing Information and Technological Awareness**
  - Introduce students to the importance of computers in daily life and in various fields of work and education.
  - Enhance students' critical thinking skills when dealing with digital information.
- **Acquiring Computer Skills**
  - Enable students to operate computers and use their basic operating systems effectively.
  - Familiarize students with the hardware and software components of a computer.
- **Developing Technical and Practical Skills**
  - Train students to use application software such as word processing, spreadsheets, and presentation programs.
  - Develop students' ability to use the Internet and e-mail effectively and securely.
- **Developing Problem-Solving Skills**
  - Enable students to use computers for data analysis and solving basic problems.
  - Introduce the fundamentals of programming (where included in the course) and develop logical and algorithmic thinking skills.

- **Promoting Ethical and Responsible Use of Technology**
    - Instill the principles of cybersecurity, privacy protection, and respect for intellectual property rights.
    - Raise awareness of cyber threats and appropriate methods of protection.
- **Preparing Students for the Digital Labor Market**
    - Prepare students to use computers as productive tools in various academic and professional fields.
    - Introduce students to recent developments in information technology.
- **Encouraging Self-Directed and Lifelong Learning**
    - Promote the use of computers as tools for research and self-learning.
    - Develop students' skills in searching for information, as well as evaluating and critically analyzing information.

9- Course Learning Outcomes and Teaching, Learning, and Assessment Methods

First: Computer Course Learning Outcomes

Upon successful completion of this course, the student is expected to be able to:

1. Knowledge and Understanding

- Identify the hardware and software components of a computer.
- Understand the fundamentals of operating systems and application software.
- Recognize the importance of computers in everyday life and the labor market.

2. Cognitive and Intellectual Skills

- Analyze simple problems and use computers to develop appropriate solutions.
- Apply basic logical and algorithmic thinking in programming (where included in the curriculum).

3. Practical and Technical Skills

- Operate a computer and use essential software applications such as **Microsoft Word, Excel, and PowerPoint**.

- Conduct Internet searches and use e-mail effectively.
- Apply the principles of digital security and privacy protection.

4. Affective and Value-Based Skills

- Demonstrate ethical behavior in the use of digital technologies and respect intellectual property rights.
- Use computers safely, responsibly, and professionally.

Second: Teaching and Learning Methods

The course adopts a variety of theoretical and practical teaching methods to suit the nature of the subject, including:

1. **Interactive lectures** – to explain theories and fundamental concepts.
2. **Presentations and educational videos** – to simplify concepts and enhance understanding.
3. **Practical sessions in the computer laboratory** – to provide hands-on training in the use of computer applications.
4. **Individual and group projects** – to enable students to apply their knowledge and skills to real-world situations.
5. **Cooperative learning and classroom discussions** – to promote active participation, collaboration, and deeper understanding.
6. **Problem-Based Learning (PBL)** – particularly in programming and logical thinking, to develop analytical and problem-solving skills.

Third: Assessment Methods

To ensure that the intended learning outcomes are achieved, a variety of assessment methods are employed, including:

1. **Written Examinations**
    - Multiple-choice questions, true/false questions, and short-answer questions.
2. **Practical Examinations**
    - Students are assigned practical computer-based tasks in the laboratory, such as creating files, formatting documents, or writing simple computer programs.
3. **Assignments and Homework**
    - Individual assignments involving the use of computer applications or information retrieval and research.
4. **Projects and Reports**
    - Individual or group practical projects designed to assess students' understanding and application of course concepts.

5. **Classroom Observation and Participation**
    - Continuous assessment of students' practical performance and active participation in classroom and laboratory activities.
6. **Oral Presentations**
    - Presentation of a project or selected topic using multimedia tools.

10.Course structure

the week	hours	Required learning outcomes	Name of the unit/topic	Teaching method	Evaluation method
2 – 1	4	Background Information	Introduction to computers: their generations, componentshardware andsoftware	Theoretical lecture + practical applications	Paper test practical + test
5-4-3	6	Windows operating system	Windows operating system : the concept of theWindows system its , advantages, basic requirements, operating the system, components of the main screen of the desktop, the concept oficons the method of , dealing withmouse activities the , importance and components of the task bar, making use ofstart to enter programs, the concept of tasks Loaded, exit the system and turn off .the calculator The concept of the window for any program and learning about its main components , dealing withRecycle bin ,my computer ,my Documents	Theoretical lecture + practical applications	Paper test practical + test

8-7-6	6	Formatting floppy disks and taking advantage of control programs	Format floppy disks, copy folders and files, make use of cut and paste and know the properties of disks, folders and files Taking advantage of the Control panel programs: such as themouse , iconthe display icon how to , change the library desktop background, control the screen saver, change the appearance and colors of window menus, and theRemove prog icon. ,add in adding and deleting programs	Theoretical lecture + practical applications	Paper test practical + test
-10-11	4	Knowledge of using the run option and some additional programs	Take advantage of theRun option to execute programs directly and learn how to get helpand its various .methods - Use entertainment programs such asMedia player Window In playing movies - Benefit from additional programs)Accessories such as (the Calculator - drawing programs to create, save, and retrieve drawings through the .commands it provides Dealing with the Notes window, Notepad ,Word	Theoretical lecture + practical applications	Paper test practical + test
13-12	4	Know the types of software	Software: Types of programs System software: Software application: Programming and computer programming languages:	Theoretical lecture + practical applications	Paper test practical + test
14	2	Knowledge of the	Using the Internet and how to deal with it	Theoretical lecture +	Paper test practical +

		Internet		practical applications	test
15	2	Knowledge of viruses that infect computers	The concept of computer viruses: how to become infected, their types, treatment, and dealing with them -through antivirus programs available within the Windows . operating system environment	Theoretical lecture + practical applications	Paper test practical + test

11. Course Development Plan

The curriculum will be continuously updated to keep pace with labor market developments through the **Curriculum Development Committee** and the **Scientific Committee**, including the following:

1- Developing and introducing curricula that are aligned with the needs of the labor market.
2- Organizing scientific seminars and conferences aimed at reviewing and updating the curriculum.
3- Keeping abreast of the latest scientific and technological developments in the field of specialization.

12. Course Evaluation

No	Evaluation methods	Calendar appointment week	degree	Relative % weight
1	Midterm Exam 1(theoretical)	The seventh week	10	10
2	Midterm Exam 1(practical)	The seventh week	10	10
3	Midterm Exam 2(theoretical)	The twelfth week	10	10
4	Midterm Exam 2(practical)	The twelfth week	10	10
5	Coursework Marks	Coursework Marks	10	10
6	Final Coursework Mark	The final week (End of the course)	50	50
7	Final practical exam	Final semester exams	10	10
8	Final theoretical exam	Final semester exams	40	40
	the total	100	100%	100%

13. Infrastructure	
Classrooms, laboratories, and workshops	Available
Required prescribed textbooks	Available
Main References (Sources)	1-Books and Tutorials provided online. 2- IC3 GS4 which stand for internet and computing core certification global standard 4. 3- Computer principles for beginners 4- Computer and off-the-shelf software
Electronic References and Internet Resources	1- https://www.edraak.org/programs/course/icdl1-v2019sp/ 2- https://isindexing.com/isi/journaldetails.php?id=8735

Course Description: **Mathematics 1**

1. Course name	Mathematics 1
2. code	TIH110
3. Available attendance forms	My presence
4. Semester/year	First year / first semester
5. Date this description was prepared	5/5/2026
6. Number of study hours (total)	30 hours / Units 2
7. Course Instructor Name	Assistant Lecturer / Aldabbagh, Mohammed M. mohammedaldabbagh@ntu.edu.iq
8. **Course objectives**	

To equip students with the fundamental mathematical knowledge and skills that enhance logical and analytical thinking, enable them to solve problems systematically, apply mathematical concepts in real-life and scientific contexts, and foster academic values such as discipline, accuracy, and teamwork.

Course Learning Objectives

- Acquire the mathematical knowledge required for the prescribed topics and understand the concepts underlying each mathematical principle.
- Develop an understanding of the fundamental nature of mathematics as an integrated system of basic mathematical concepts that provides a strong foundation for studying other mathematical disciplines.
- Be able to apply appropriate methods for solving equations.
- Be able to solve partial differential equations.
- Be able to calculate the area and volume of geometric figures and solids.
- Be able to solve problems involving differentiation and integration.

9. Course Learning Outcomes and Teaching, Learning, and Assessment Methods

A. Course Learning Outcomes

Definition:
Course Learning Outcomes (CLOs) are the knowledge, skills, and values that the course aims to develop in students.

Importance:
They provide learners with a clear understanding of what they are expected to know and be able to do upon successful completion of the course. They also serve as a foundation for course design, delivery, and assessment.

How They Are Determined:
Course Learning Outcomes are developed in alignment with the objectives and intended learning outcomes of the academic program to which the course belongs.

B. Course Skill Objectives

1. Develop the ability to graph mathematical functions.
2. Develop the ability to perform vector analysis.

Teaching and Learning Methods

1. Theoretical lectures.

Assessment Methods

1. Written examinations.
2. Assignments.
3. Reports.

C. Affective and Value-Based Objectives

1. Enhance students' self-confidence.
2. Develop effective time management skills and encourage productive use of time.
3. Foster a spirit of healthy competition among students.

Teaching and Learning Methods

1. Classroom lectures.
2. Use of modern instructional tools, including calculators and Internet-based resources.

Assessment Methods

1. Written examinations.
2. Assignments.
3. Reports.

D. General and Transferable Skills (Employability and Personal Development Skills)

1. Develop the ability to analyze moments and apply them in the fields of irrigation and engineering.
2. Develop the ability to determine velocity and acceleration using applications of differential calculus.

10.Course structure					
the week	hours	Required learning outcomes	Name of the unit/topic	Teaching method	Evaluation method
1	2	Properties of Trigonometric Ratios	Trigonometric Ratios	Theoretical lecture	Questions and Answers, Discussion , ritten Examination
2	2	Logarithms	Logarithms	Theoretical lecture	Questions and Answers, Discussion , ritten Examination
3	2	Introduction to Differentiation	Differentiation	Theoretical lecture	Questions and Answers, Discussion , ritten Examination
4	2	Differentiation Rules for Algebraic Functions	Differentiation	Theoretical lecture	Questions and Answers, Discussion , ritten Examination
5	2	Derivative of Composite Functions (Chain Rule)	Differentiation	Theoretical lecture	Questions and Answers, Discussion , ritten Examination
6	2	Tutorial and Exercises	Differentiation	Theoretical lecture	Questions and Answers, Discussion , ritten Examination
7	2	Implicit Differentiation, Derivatives of Trigonometric Functions, and Inverse Trigonometric Functions	Differentiation	Theoretical lecture	Questions and Answers, Discussion , ritten Examination
8	2	Tutorial and Exercises	Differentiation	Theoretical lecture	Questions and Answers, Discussion , ritten Examination
9	2	Rules of Differentiation	Derivatives	Theoretical lecture	Questions and Answers, Discussion , ritten Examination

10	2	Advanced Differentiation Rules	Derivatives	Theoretical lecture	Questions and Answers, Discussion , ritten Examination
11	2	Derivatives of Logarithmic Functions	Derivatives	Theoretical lecture	Questions and Answers, Discussion , ritten Examination
12	2	Tutorial and Exercises	Derivatives	Theoretical lecture	Questions and Answers, Discussion , ritten Examination
13	2	Introduction to Integration	Integration	Theoretical lecture	Questions and Answers, Discussion , ritten Examination
14	2	Advanced Integration Techniques	Integration	Theoretical lecture	Questions and Answers, Discussion , ritten Examination
15	2	Tutorial and Exercises	Integration	Theoretical lecture	Questions and Answers, Discussion , ritten Examination

11. Course development plan

- Analyze the course and identify development needs, including reviewing the current Course Learning Outcomes (CLOs).
- Update the course content and diversify teaching and learning methods.
- Monitor recent scientific and technological developments and continuously improve assessment methods.

12. Course Evaluation

No	Evaluation methods	Calendar appointment week	degree	Relative % weight
1	Midterm Exam 1(theoretical)	The seventh week	30	30
2	Midterm Exam 2(theoretical)	The twelfth week	30	30
3	Coursework Marks	Coursework Marks	10	10
4	Final Coursework Mark	The final week (End of the course)	40	40
5	Final theoretical exam	Final semester exams	60	60
	the total	100	100%	100%

13. Infrastructure

Classrooms, laboratories, and workshops	Available
Required prescribed textbooks	Available
Main References	Teaching bag for mathematics
	Calculas book
	Thomas Calculus 12th edition George B. Thomas .
	Maurice D. Weir.
Recommended books and references (scientific journals, reports	Journal of Mathematics Education
Electronic references, Internet sites	https://ar.wikipedia.org/wiki/%D9%85%D8%AC%D9%84%D8%A9_%D8%A7%D9%84%D8%B1%D9%8A%D8%A7%D8%B6%D9%8A%D8%A7%D8%AA

Course Description: **Mathematics 2**

1. Course name	Mathematics 2
2. code	TIH111
3. Available attendance forms	My presence
4. Semester/year	First year /Second Semester
5. Date this description was prepared	5/5/2026
6. Number of study hours (total)	30 hours / Units 2
7. Course Instructor Name	Assistant Lecturer / Aldabbagh, Mohammed M. mohammedaldabbagh@ntu.edu.iq
8. **Course objectives**	

To equip students with the fundamental mathematical knowledge and skills that enhance logical and analytical thinking, enable them to solve problems systematically, apply mathematical concepts in real-life and scientific contexts, and foster academic values such as discipline, accuracy, and teamwork.

Course Learning Objectives

- Acquire the mathematical knowledge required for the prescribed topics and understand the concepts underlying each mathematical principle.
- Develop an understanding of the fundamental nature of mathematics as an integrated system of basic mathematical concepts that provides a strong foundation for studying other mathematical disciplines.
- Be able to apply appropriate methods for solving equations.
- Be able to solve partial differential equations.
- Be able to calculate the area and volume of geometric figures and solids.
- Be able to solve problems involving differentiation and integration.

9. Course Learning Outcomes and Teaching, Learning, and Assessment Methods

A. Course Learning Outcomes

Definition:
Course Learning Outcomes (CLOs) are the knowledge, skills, and values that the course aims to develop in students.

Importance:
They provide learners with a clear understanding of what they are expected to know and be able to do upon successful completion of the course. They also serve as a foundation for course design, delivery, and assessment.

How They Are Determined:
Course Learning Outcomes are developed in alignment with the objectives and intended learning outcomes of the academic program to which the course belongs.

B. Course Skill Objectives

1. Develop the ability to graph mathematical functions.
2. Develop the ability to perform vector analysis.

Teaching and Learning Methods

1.Theoretical lectures.

Assessment Methods

1.Written examinations.

2.Assignments.

3.Reports.

C. Affective and Value-Based Objectives

1.Enhance students' self-confidence.

2.Develop effective time management skills and encourage productive use of time.

3.Foster a spirit of healthy competition among students.

Teaching and Learning Methods

1. Classroom lectures.
2. Use of modern instructional tools, including calculators and Internet-based resources.

Assessment Methods

1. Written examinations.
2. Assignments.
3. Reports.

D. General and Transferable Skills (Employability and Personal Development Skills)

1. Develop the ability to analyze moments and apply them in the fields of irrigation and engineering.
2. Develop the ability to determine velocity and acceleration using applications of differential calculus.

10.Course structure

the week	hours	Required learning outcomes	Name of the unit/topic	Teaching method	Evaluation method
1	2	Matrices and Determinants	Matrices	Theoretical lecture	Paper test + report
2	2	Types of Matrices	Matrices	Theoretical lecture	Paper test + report
3	2	Basic Algebraic Operations on Matrices	Matrices	Theoretical lecture	Paper test + report
4	2	Finding Determinants of 3×33 \times 33×3 Matrices	Matrices	Theoretical lecture	Paper test + report
5	2	Systems of Linear Equations	Systems of Linear Equations	Theoretical lecture	Paper test + report
6	2	Cramer's Rule	Cramer's Rule	**Theoretical lecture**	**Paper test + report**
7	2	Applied Exercises	Cramer's Rule	Theoretical lecture	Paper test + report
8	2	Vectors and Scalar Quantities	Vectors	**Theoretical lecture**	**Paper test + report**
9	2	Algebraic Operations on Vectors	Vectors	Theoretical lecture	Paper test + report
10	2	Applied Exercises	Vectors	Theoretical lecture	Paper test + report
11	2	Complex Numbers	Complex Numbers	Theoretical lecture	Paper test + report
12	2	Algebraic Operations on Complex Numbers	Complex Numbers	Theoretical lecture	Paper test + report
13	2	Applied Exercises	Complex Numbers	Theoretical lecture	Paper test + report
14	2	Forms of Representing Complex Numbers	Complex Numbers	Theoretical lecture	Paper test + report
15	2	Applied Exercises	Complex Numbers	Theoretical lecture	Paper test + report

11. Course development plan

- Analyze the course and identify development needs, including reviewing the current Course Learning Outcomes (CLOs).
- Update the course content and diversify teaching and learning methods.
- Monitor recent scientific and technological developments and continuously improve assessment methods.

12. Course Evaluation

No	Evaluation methods	Calendar appointment week	degree	Relative % weight
1	Midterm Exam 1(theoretical)	The seventh week	30	30
2	Midterm Exam 2(theoretical)	The twelfth week	30	30
3	Coursework Marks	Coursework Marks	10	10
4	Final Coursework Mark	The final week (End of the course)	40	40
5	Final theoretical exam	Final semester exams	60	60
	the total	100	100%	100%

13.Infrastructure	
Classrooms, laboratories, and workshops	Available
Required prescribed textbooks	Available
Main References	Teaching bag for mathematics
	Calculas book
	Thomas Calculus 12th edition George B. Thomas .
	Maurice D. Weir.
Recommended books and references (scientific journals, reports	Journal of Mathematics Education
Electronic references, Internet sites	https://ar.wikipedia.org/wiki/%D9%85%D8%AC%D9%84%D8%A9_%D8%A7%D9%84%D8%B1%D9%8A%D8%A7%D8%B6%D9%8A%D8%A7%D8%AA

Course Description: **Computer**

1. Course name1.	Computer
2. code	NTU201
3. Available attendance forms	My presence
4. Semester/year	Second semester /second year
5. Date this description was prepared	5/5/2026
6. Number of study hours/ Units	30 hours / Units 2
7. Course Instructor Name	Lecturer / Jasim Ibrahim Musa jasim_hwj@ntu.edu.iq

8-Course objectives

- To introduce students to **Microsoft Excel**.
- To familiarize students with the different types of menus in Microsoft Excel.
- To introduce students to creating and drawing charts using Microsoft Excel.

9- Course outcomes and teaching, learning and evaluation methods

The Computer Course aims to enable students to acquire the fundamental knowledge and skills required to use computers and their applications, particularly **Microsoft Excel**, in order to enhance their ability to utilize modern technologies in academic and practical settings while adhering to digital ethics and maintaining information privacy.

A. By the end of the course, students will be able to:

1- Use **Microsoft Excel** efficiently for data entry, organization, and processing.
2- Identify and effectively use the basic menus and tools in **Microsoft Excel** to perform various tasks.
3- Create and format charts for effective data presentation and analysis.

4- Become familiar with modern computer programs and applications and keep pace with technological developments in the field.
5- Demonstrate ethical and responsible use of computers while maintaining information security and privacy.
6- Apply the acquired computer skills to solve simple problems and complete academic tasks using computer applications.

B. Course Skill Objectives

1. Develop students' ability to use **Microsoft Excel** correctly and efficiently.

Teaching and Learning Methods

1. Lectures.
2. Question-and-answer sessions.
3. Use of smart boards and data projectors.
4. Practical computer-based training and hands-on exercises.

Assessment Methods

1. Monthly examinations.
2. Daily quizzes.
3. Assignments.
4. Classroom discussions and participation.
5. Evaluation of practical tasks through reports or computer-based applications.

C. Affective and Value-Based Objectives

1. Foster a generation that is open to the world of information and digital technology.
2. Develop students' ability to keep pace with modern life and its technological and electronic requirements.

3. Promote responsible and ethical use of computers and information technology.
4. Encourage teamwork, self-learning, and continuous skill development.

Teaching and Learning Methods

1. Continuous practical application using computers and software programs.
2. Hands-on exercises and laboratory activities.
3. Daily quizzes, homework, and practical computer assignments.

Assessment Methods

1. Evaluation of practical assignments and computer-based activities.
2. Awarding marks for homework, participation, and practical performance.
3. Monthly and daily examinations.

10. Course structure					
the week	hours	Required learning outcomes	Name of the unit/topic	Teaching method	Evaluation method
1	2	Get to know the program	Introduction to Excel 2010	Theoretical lecture practical lecture +	Theoretical test + practical test
2	2	Learn about menu commands	File menu commands	Theoretical lecture practical lecture +	Theoretical test + practical test
5-4-3	6	Learn about menu commands	Home menu commands	Theoretical lecture practical lecture +	Theoretical test + practical test
7-6	4	Learn about menu commands	Insert menu commands	Theoretical lecture practical lecture +	Theoretical test + practical test
9-8	4	Learn about menu commands	layout menu commands	Theoretical lecture practical lecture +	Theoretical test + practical test
10	2	Learn about menu commands	charts	Theoretical lecture practical lecture +	Theoretical test + practical test
12-11	4	Learn about menu commands	Formulas menu commands	Theoretical lecture practical lecture +	Theoretical test + practical test
13	2	Learn about menu commands	Data menu commands	Theoretical lecture practical lecture +	Theoretical test + practical test
15-14	4	Learn about menu commands	Review and display commands Andview	Theoretical lecture practical lecture +	Theoretical test + practical test

11. Course development plan

- Develop and introduce updated curricula that meet the current needs of the labor market.
- Organize scientific seminars and conferences aimed at reviewing and updating the curriculum.
- Keep pace with recent scientific and technological developments in the field of specialization and continuously update the course content accordingly.

12. Course Evaluation

No	Evaluation methods	Calendar appointment week	degree	Relative % weight
1	Midterm Exam 1(theoretical)	The seventh week	10	10
2	Midterm Exam 1(practical)	The seventh week	10	10
3	Midterm Exam 2(theoretical)	The twelfth week	10	10
4	Midterm Exam 2(practical)	The twelfth week	10	10
5	Coursework Marks	Coursework Marks	10	10
6	Final Coursework Mark	The final week (End of the course)	50	50
7	Final practical exam	Final semester exams	10	10
8	Final theoretical exam	Final semester exams	40	40
	the total	100	100%	100%

13. Infrastructure

Classrooms, laboratories, and workshops	Available
Required prescribed textbooks	Available
Main References	**Aboud, Z. M., Abdulmajeed, G. H., et al.** Computer Fundamentals and Office Applications. This book covers the fundamental concepts of computer science according to the curriculum of the Iraqi Ministry of Higher Education and Scientific Research and serves as a reference for first-year students in Iraqi universities.

	Al-Saeed, M. Introduction to Computers. This book provides a detailed explanation of computers, their components, software types, and computer networks.
	Mustafa, H. A. Computer Principles and Information Technology. This book presents a simplified explanation of computer hardware, software, and commonly used computer applications.
	Al-Shayji, A. R. Introduction to Computers and Their Applications. The book discusses the fundamental principles of computer hardware and software and includes practical computer applications.

Recommended books and references (scientific journals, reports	• **Hsoub Academy**
	  • Provides comprehensive articles and tutorials on computer fundamentals, programming, and operating systems.
	• **Taallam (Learn)**
	  • Offers free educational courses in various computer-related fields, including computer fundamentals.

Electronic references, Internet sites	• **W3Schools** (www.w3schools.com)
	  • Provides tutorials and practical examples for learning programming languages such as **HTML, CSS, JavaScript**, and other web technologies.
	• **GeeksforGeeks** (www.geeksforgeeks.org)
	  • Offers comprehensive tutorials, articles, coding examples, and practice problems in computer science, programming, data structures, algorithms, and software development.
	• **TutorialsPoint** (www.tutorialspoint.com)
	  • Provides learning materials and tutorials on computer fundamentals, programming, computer networks, cybersecurity, operating systems, databases, and many other IT topics.

Course Description: **Ethics of the Profession**

1. Course name	Ethics of the Profession
2. code	NTU204
3. Available attendance forms	My presence
4. Semester/year	first semester / second year
5. Date this description was prepared	5/5/2026
6. Number of study hours/ Units	30 hours / Units 2
7. Course Instructor Name	Lecturer / Jasim Ibrahim Musa jasim_hwj@ntu.edu.iq

8- Course objectives

- To introduce students to ethical values in general.
- To familiarize students with institutional ethical values in particular.
- To introduce the laws and regulations governing institutional ethical values.
- To promote ethical conduct within institutions by understanding professional rights and responsibilities.
- To encourage compliance with the rights and duties stipulated by law as an indication of commitment to professional ethics.
- To avoid all violations prohibited by laws and regulations.

9- Course outcomes and teaching, learning and evaluation methods

Course Learning Outcomes

1. Understand the fundamental concepts of **professional ethics** and their role in the workplace.
2. Identify the ethical principles associated with professional practices across different disciplines.
3. Analyze ethical situations encountered in the workplace and make responsible professional decisions.

4. Demonstrate commitment to social responsibility and respect for institutional values in the work environment.
5. Develop ethical communication skills within teams and evaluate the impact of unethical behavior on individuals and organizations.

Definition

Professional Ethics is an academic course that examines the ethical principles and values governing individuals' behavior in professional practice. It guides students toward making responsible decisions based on ethical principles and accepted standards of professional conduct. The course aims to strengthen commitment to professional responsibility, integrity, and respect for laws, regulations, and organizational standards.

Importance

1. Promote integrity and professional responsibility among students before they enter the labor market.
2. Prepare competent professionals capable of making ethical decisions when facing real-world challenges.
3. Foster a work environment based on trust and mutual respect within organizations.
4. Contribute to sustainable development by linking professional conduct with fundamental human values.

How the Course Learning Outcomes Are Determined

1. Ensuring compliance with applicable laws, regulations, instructions, and codes of professional conduct.
2. Referring to international codes of ethics and professional standards.
3. Analyzing the nature of the profession and its ethical requirements.
4. Identifying the ethical values associated with the profession.
5. Protecting the organization's reputation and avoiding legal and reputational risks.

A. Cognitive Objectives

A1. Introduce students to the concept of professional ethics, its importance in professional life, and its role in enhancing organizational performance.

A2. Enable students to understand the ethical principles and values that govern professional practice, as well as their sources, relevant legislation, and professional codes of conduct.

A3. Equip students with the knowledge required to interpret and analyze ethical issues and make professional decisions in accordance with legal and ethical standards.

B. Course-Specific Skill Objectives

B1. Develop students' ability to apply the principles of professional ethics in practical situations and make sound professional decisions.

B2. Develop students' skills in analyzing ethical problems, evaluating alternatives, and selecting solutions that comply with professional values and applicable laws.

B3. Enhance students' professional communication, teamwork, and commitment to the rights and responsibilities of employees within the workplace.

Teaching and Learning Methods

- Interactive lectures.
- Group discussions and dialogue.
- Case studies.
- Student presentations.
- E-learning.
- Assignments, reports, and short research projects.
- Use of modern instructional technologies, including data projectors, educational videos, and online learning platforms.

Assessment Methods

- Daily quizzes.
- Monthly examinations.
- Final examination.
- Reports and research assignments.
- Classroom participation and discussions.
- Assessment of presentations and homework.

C. Affective and Value-Based Objectives

These objectives aim to develop students' attitudes and values that promote responsible professional behavior and reinforce a culture of integrity, transparency, and commitment to professional ethics.

C1. Strengthen students' sense of professional responsibility and commitment to ethical values in the workplace.

C2. Promote the values of integrity, honesty, fairness, and respect for laws, regulations, and professional codes of conduct.

C3. Foster respect for the rights of others, encourage teamwork, and promote acceptance of diverse opinions.

C4. Encourage self-directed learning, continuous professional development, and the responsible and ethical use of modern technologies.

Teaching and Learning Methods

- Interactive lectures.
- Group discussions.
- Analysis of real-life ethical case studies.
- Cooperative learning.
- Use of modern instructional media and online learning platforms.

Assessment Methods

- Active participation in classroom discussions.
- Evaluation of reports and research assignments.
- Assessment of student presentations.
- Daily, monthly, and final examinations.
- Evaluation of group activities and practical applications.

10. Course structure					
the week	hours	Required learning outcomes	Name of the unit/topic	Teaching method	Evaluation method
1	2	Introduction to the concepts and definitions of Professional Ethics.	Nature of Professional Ethics.	- Screening a video on Professional Ethics. - Discussing real-life case studies and key questions on how members of society can adhere to professional ethics.	Short quiz (objective questions) on topics related to Professional Ethics, with students assessed based on the accuracy of their answers.
2	2	Understanding the importance of professional ethics and its impact on social and workplace relationships.	Importance of Professional Ethics.	Asking questions and writing answers.	Same method as above.
3	2	Introduction to the concept, principles, and elements of Codes of Professional Conduct.	Ethical Thought and Professional Conduct.	Same methods as above.	Assessment of students' performance during simulation activities (accuracy of application and response time).
4	2	Explaining the concept of Social Responsibility and its fundamental principles.	Ethical Accountability and Social Responsibility.	Theoretical workshops and simulation activities.	Performance assessment and skills tests.

5	2	Conducting discussions on key concepts such as duty, job, work, ethics, profession, and their importance in the work environment.	Key Terminology in Professional Ethics.	Written examinations and performance assessment.	Written examination and comprehensive assessment of students' skills.
6	2	Identifying the different types of organizations and the role of ethics in the workplace.	Organizations and Professional Ethics.	Lectures and case studies.	Written examination and case study analysis.
7	2	Preparing reports and papers on the topics covered during previous weeks.	Workshop / Assignment.	Presentations and workshops.	Examination and performance assessment.
8	2	Understanding the concept of public service, its components, and the role of the public employee in promoting professional ethics.	Employment and Professional Ethics.	Training sessions and interactive lectures.	Assessment and written examination.
9	2	Identifying the rights and duties of public employees and their ethical and legal obligations.	Employees' Rights and Duties.	Case studies and lectures.	Written examination and case study analysis.
10	2	Studying administrative law through the relationship between public employees and professional ethics.	Administrative Law and Professional Ethics.	Written examinations and performance assessment.	Written examination and comprehensive assessment of students' skills.
11	2	Identifying the different levels of education (primary, secondary, and higher education) and the ethical principles governing each.	Ethics in Education.	Lectures and practical training.	Examination and performance assessment.
12	2	Studying the codes of ethics adopted by various professions and their role in regulating professional conduct.	Ethics in Various Professions.	Interactive lectures and group discussions.	Written examination and discussion questions.

13	2	Understanding the concept of integrity and related topics, and examining their relationship with professional ethics.	Integrity and Professiona l Ethics.	Same methods as above.	Written examination and case study analysis.
14	2	Studying the ethics of political work throughout history and the responsibilities of political leaders toward society.	Political Ethics.	Same methods as above.	Examination and performance assessment.
15	2	Worksheets and assignments covering the topics studied in previous weeks and lectures.	Worksheet	Student presentation of the worksheet followed by discussion with the instructor and classmates.	Assessment and written examination.

11. Course development plan

- Update the curriculum continuously to keep pace with recent developments in the field of Professional Ethics.
- Organize scientific seminars and workshops in collaboration with specialists in the field of professional ethics.
- Monitor social and professional developments related to codes of professional conduct and incorporate them into the course content.

12. Course Evaluation

No	Evaluation methods	Calendar appointment week	degree	Relative % weight
1	Midterm Exam 1(theoretical)	The seventh week	30	30
2	Midterm Exam 2(theoretical)	The twelfth week	30	30
3	Coursework Marks	Coursework Marks	10	10
4	Final Coursework Mark	The final week (End of the course)	40	40
5	Final theoretical exam	Final semester exams	60	60
	the total	100	100%	100%

13. Infrastructure

Classrooms, laboratories, and workshops	Available
Required prescribed textbooks	• Professional Ethics Lecture Notes. • Professional Ethics / Dr. Salem Mohammed.
Main References	Organization Theory / Dr. Mohammed Hassan Al-Shamma.
Recommended books and references (scientific journals, reports	Administrative Law / Dr. Mazin Lilo Radhi.
Electronic references, Internet sites	

Course Description: **English language1**

1. Name/government	English language 1
2. code	NTU101
3. OPP attendance available	My presence
4. Semester/year	First year / first semester
5. Date this description was prepared	5/5/ 2026
6. Number of study hours/ Units	30 hours / Units 2
7. Course Instructor Name	Assistant Lecturer / Mohammed Medhat Mohammed mohammedaldabbagh@ntu.edu.iq

8- Course objectives

1. Develop students' fundamental English language skills: listening, speaking, reading, and writing.
2. Enhance students' ability to use English effectively in everyday and professional situations.
3. Familiarize students with English terminology related to their field of specialization.

9. **Course outcomes and teaching, learning and evaluation methods**

- Recognize basic vocabulary and terminology related to everyday life and the student's field of specialization.
- Distinguish between different English tenses and use them correctly in sentences.
- Understand the structure of English sentences, including the subject, verb, and object.
- Demonstrate a positive attitude toward learning English and using it in daily life.
- Show confidence when speaking English in front of others.
- Appreciate the importance of the English language for academic and professional development.

A. Cognitive Objectives

A1. Enable students to understand and follow basic instructions and classroom communication in English.

A2. Develop students' understanding of fundamental English grammar and its correct application.

A3. Expand students' vocabulary and improve their understanding of word meanings and common expressions related to everyday life and their field of study.

B. Course-Specific Skill Objectives

B1. Develop students' ability to use English grammar accurately in speaking and writing.

B2. Enhance students' skills in using appropriate English vocabulary and expressions in academic and everyday contexts.

B3. Improve students' reading, writing, listening, and speaking skills through practical language activities.

Teaching and Learning Methods

- Interactive lectures.
- Discussion and dialogue.
- Question-and-answer sessions.
- Practical language exercises and classroom activities.
- Student presentations and assignments.
- Use of modern educational technologies (Data Show, audio and video resources, and e-learning platforms).
- Guided reading and writing activities.
- Linking language topics to students' academic specialization and daily life.

Assessment Methods

- Weekly quizzes.
- Monthly examinations.
- Midterm and final examinations.
- Classroom participation and discussions.
- Homework assignments and written exercises.
- Oral presentations and speaking activities.
- Continuous assessment of language performance during classroom activities.

C. Affective and Value-Based Objectives

C1. Foster a positive attitude toward learning and using the English language.

C2. Build students' self-confidence in communicating in English.

C3. Encourage independent learning through the effective use of books, references, and electronic learning resources.

C4. Develop appreciation for the importance of English in academic, professional, and personal development.

Teaching and Learning Methods

- Interactive lectures.
- Group discussions and collaborative learning.
- Educational videos and multimedia resources.
- Language practice through pair and group activities.
- Guided use of online learning resources and digital platforms.
- Encouraging self-learning and independent reading.

Assessment Methods

- Weekly and monthly quizzes.
- Midterm and final examinations.
- Assessment of classroom participation and discussions.
- Evaluation of assignments, presentations, and language projects.
- Continuous assessment of students' progress in language skills.

D. General and Transferable Skills (Employability and Personal Development)

D1. Enable students to use printed and electronic references effectively to support language learning.

D2. Develop teamwork, communication, and presentation skills through workshops and collaborative activities.

D3. Enhance students' ability to use modern educational technologies and digital tools in learning and communicating in English.

10. Course structure					
the week	hours	Required learning outcomes	Name of the unit/topic	Teaching method	Evaluation method
1	2	Identify and use the verb am/are/is correctly in simple sentences. Use the pronouns my/your to describe basic personal information.	Unit one :hello Am/are/is, my/your This is with practice in work	theoretical	Diagnostic, formative and summative
2	2	Use subject pronouns he/she/they and possessive adjectives his/her accurately. Form and answer basic yes/no and wh- questions using “to be”.	Unit two :your world He/she /they, his/her Questions	theoretical	Diagnostic, formative and summative
3	2	Provide simple personal information (e.g., age, nationality, likes/dislikes). Respond to personal questions using correct sentence structures.	Unit three: all about	theoretical	Diagnostic, formative and summative
4	2	Use possessive adjectives and possessive 's to talk about relationships and belongings. Use has/have correctly with singular and plural nouns.	Unit four:family and friends Possessive adjectives Possessive's Has/have Adjective+ noun	theoretical	Diagnostic, formative and summative
5	2	Use the present simple tense with I/you/we/they to describe routines. Use articles a/an correctly. Create descriptive phrases using adjective + noun structure	Unit Five :the way I live Present simple l/you /we /they A and an Adjective + noun	theoretical	Diagnostic, formative and summative
6	2	Use the present simple tense with he/she and form questions and negatives. Use adverbs of frequency (e.g., always, usually, never) to describe daily habits.	Unit six : every day Present simple he/she Questions and negatives Adverbs of frequency	theoretical	Diagnostic, formative and summative
7	2	Use question words (e.g., what, who, where) to ask for specific information. Distinguish between subject and object pronouns. Use this/that to refer to objects near or far.	Unit seven :my favorites Question words Pronouns This and that	theoretical	Diagnostic, formative and summative
8	2	Describe a place using There is/There	Unit eight :where I	theoretical	Diagnostic,

		are and common prepositions of place. Talk about furniture, rooms, and .locations using basic vocabulary	live There is /are... Prepositions		formative and summative
9	2	Use was/were born to describe personal history. Recognize and use common irregular .verbs in the past simple tense	Unit nine :times past Was /were born Past simple - irregu lar verbs	theoretical	Diagnostic, formative and summative
10	2	Use past simple tense for both regular and irregular verbs to describe past events. Form questions and negatives in the past tense. Use the time expression ago to talk about past events.	Unit ten: we had a great time! Past simple -regular & irregular Question Negatives Ago	theoretical	Diagnostic, formative and summative
11	2	Use can/can't to express ability and permission. Use adverbs to describe how something is done (e.g., quickly, well). .Make and respond to simple requests	Unit eleven: I can Can /can't /do that Adverbs Requests	theoretical	Diagnostic, formative and summative
12	2	Use some/any in affirmative and negative sentences. Express preferences using like and would like. Practice polite expressions such as thank you, please, I'd like...	Unit twelve: please I'd like... Some and any Like and would like and thank you	theoretical	Diagnostic, formative and summative
13	2	Use the present continuous tense to describe current actions. Distinguish between present simple .and present continuous in context	Unit thirteen: here and now Present continuous Present simple & present continuous	theoretical	Diagnostic, formative and summative
-14 15	4	Make and talk about future plans using simple future expressions (e.g., going to). Review and consolidate key grammar and vocabulary from previous units. Write an email and an informal letter using appropriate format and language.	it's time to go! Future plans Revision writing email and informant letter	theoretical	Diagnostic, formative and summative

11. Course development plan

•Continuously updating vocabulary to meet the needs of engineering students.
•Increasing practical activities (language lab) to improve listening and pronunciation skills.
•Linking writing topics to basic engineering concepts.

•Staying up-to-date with the latest developments in English language teaching methodologies.

12. Course Evaluation

No	Evaluation methods	Calendar appointment week	degree	Relative % weight
1	Midterm Exam 1(theoretical)	The seventh week	30	30
2	Midterm Exam 2(theoretical)	The twelfth week	30	30
3	Coursework Marks	Coursework Marks	10	10
4	Final Coursework Mark	The final week (End of the course)	40	40
5	Final theoretical exam	Final semester exams	60	60
	the total	100	100%	100%

13. Infrastructure

Classrooms, laboratories, and workshops	Available
Required prescribed textbooks	Available
Main References	1- Newheadway Plus, Beginner Student's book by John & Liz Soars. Oxford. 2- Newheadway Plus, Beginner Workbook by John & Liz Soars. Oxford.
Recommended books and references (scientific journals, reports	3- Basic English Grammar by Betty Azar. 4- Oxford Picture Dictionary.
Electronic references, Internet sites	BBC Learning English, British Council Learn English

Course Description: **Human rights and democracy**

1. Course name1.	Human rights and democracy
2. code	NTU 100
3. Available attendance forms	My presence
4. Semester/year	first semester /First year
5. Date this description was prepared	5/5/2026
6. Number of study hours/ Units	30 hours / Units 2
7. Course Instructor Name	Lecturer / Mohammed Yaseen Hussein mohammedyaseen_hwj@ntu.edu.iq

8-Course objectives

- To introduce students to the fundamental concepts of **Human Rights** and **Democracy**.
- To enhance students' awareness of human values, justice, and freedom.
- To develop students' understanding of the legal and international foundations of human rights.
- To relate the principles of democracy to practices in public life and institutional settings.

9- Course outcomes and teaching, learning and evaluation methods

- Identify the fundamental concepts related to **Human Rights** and **Democracy**.
- Analyze legal texts related to human rights and public freedoms.
- Promote the values of human dignity, tolerance, and respect for others.
- Develop a sense of responsibility toward respecting human rights and active participation in society.

A. Cognitive Objectives

A1. Introduce students to the concepts, principles, and classifications of human rights and the scope of their application.

A2. Explain the historical development of human rights and democracy at the national and international levels.

A3. Develop students' understanding of the concepts of freedom, equality, justice, and citizenship within the framework of human rights.

A4. Familiarize students with the constitutional, legal, and international foundations of human rights, with particular reference to the Iraqi Constitution and international human rights conventions.

A5. Enable students to recognize the rights and duties of individuals and the importance of balancing rights with responsibilities in society.

B. Course-Specific Skill Objectives

B1. Develop students' ability to analyze issues related to human rights and democracy using logical and scientific approaches.

B2. Enable students to interpret legal and constitutional texts related to human rights and public freedoms.

B3. Enhance students' awareness of citizenship, social responsibility, and respect for cultural and religious diversity.

B4. Develop students' ability to identify internationally recognized human rights and understand the legal mechanisms for their protection.

B5. Encourage students to apply the principles of human rights and democracy in academic, professional, and community settings.

Teaching and Learning Methods

- Interactive lectures.
- Group discussions and seminars.
- Case studies.
- Student reports and research assignments.
- Presentations.

- Problem-based learning.
- Use of multimedia and electronic learning resources.

Assessment Methods

- Written examinations.
- Oral examinations.
- Quizzes.
- Assignments and reports.
- Classroom participation and discussions.
- Student presentations.

C. Affective and Value-Based Objectives

C1. Foster respect for human rights, equality, justice, and the rule of law.
C2. Encourage objective thinking and constructive dialogue when discussing social and national issues.
C3. Strengthen students' commitment to citizenship, tolerance, peaceful coexistence, and respect for diversity.
C4. Develop ethical responsibility toward protecting human rights and promoting democratic values in society.

Teaching and Learning Methods

- Interactive lectures.
- Discussions based on real-life examples and case studies.
- Brainstorming sessions.
- Problem-solving activities.
- Guided discussions and critical thinking exercises.
- Use of multimedia and digital learning resources.

Assessment Methods

- Written examinations.
- Short quizzes.
- Oral discussions and questioning.
- Evaluation of reports and research assignments.
- Assessment of classroom participation and presentations.
- Evaluation of students' ability to relate human rights concepts to contemporary social issues.

D. General and Transferable Skills (Employability and Personal Development)

D1. Develop research skills through the use of books, academic journals, and reliable electronic resources related to human rights and democracy.

D2. Develop the ability to analyze national constitutions, international conventions, and legal documents related to human rights.

D3. Enhance students' digital literacy by effectively using the Internet and electronic databases to access and evaluate information related to human rights and democracy.

10-Course structure

the week	hours	Required learning outcomes	Name of the unit/topic	Teaching method	Evaluation method
1	2	Define the concept of Human Rights and explain their fundamental objectives.	Human Rights: Definition, concepts, and objectives.	Theoretical	Monthly Examinations and Final Examination
2	2	Explain the historical development of the concept of human rights throughout different eras.	The Historical Roots and Development of Human Rights: Human rights in ancient and medieval history.	Theoretical	Monthly Examinations and Final Examination
3	2	Describe how the principles of human rights emerged in ancient civilizations.	Human Rights in Mesopotamian Civilization.	Theoretical	Monthly Examinations and Final Examination
4	2	Identify examples of ancient laws and legal codes (such as the Code of Hammurabi) that addressed human rights.	Human Rights in the Divine Religions: A special study of human rights in Islam.	Theoretical	Monthly Examinations and Final Examination
5	2	Explain how the revealed religions, particularly Islam, addressed human rights.	Human Rights in the Middle Ages: Human rights in philosophical doctrines, schools of thought, theories, charters, declarations, and	Theoretical	Monthly Examinations and Final Examination

			constitutions.		
6	2	Describe how philosophers and different schools of thought have approached the concept of human rights.	Human Rights in Modern and Contemporary History: International recognition of human rights through the League of Nations and the United Nations.	Theoretical	Monthly Examinations and Final Examination
7	2	Recognize the role of the League of Nations and the United Nations in promoting and recognizing human rights.	Regional Recognition of Human Rights: The European Convention on Human Rights (1950) and the American Convention on Human Rights (1969).	Theoretical	Monthly Examinations and Final Examination
8	2	Distinguish between democratic and non-democratic political systems. Identify the main characteristics of a democratic system.	Introduction to Democracy • Definition of Democracy. • Differences Between Democratic and Non-Democratic Systems.	Theoretical	Monthly Examinations and Final Examination
9	2	Identify the different types of democracy and provide examples of each. Explain the differences between the various forms of democracy.	Types of Democracy • Direct Democracy • Representative Democracy • Participatory Democracy	Theoretical	Monthly Examinations and Final Examination
10	2	Explain the fundamental principles of a democratic system. Relate democratic principles to universal human values.	Fundamental Principles of Democracy • Majority Rule • Rule of Law • Respect for Human Rights and Fundamental	Theoretical	Monthly Examinations and Final Examination

			Freedoms		
11	2	Recognize the student's role and responsibilities as an active citizen. Express the importance of participation in public life and community affairs.	Active Citizenship • The Concept of Citizenship • Citizens' Rights and Responsibilities • Participation in Public Life	Theoretical	Monthly Examinations and Final Examination
12	2	Explain the relationship between democracy and the protection of human rights. Analyze the importance of freedom of expression in democratic systems.	Democracy and Human Rights • The Relationship Between Democracy and the Protection of Human Rights • Freedom of Expression, Assembly, and Association	Theoretical	Monthly Examinations and Final Examination
13	2	Explain the functions of the major institutions within a democratic system. Understand the principle of the separation and balance of powers.	Institutions of a Democratic System • The Parliament • The Judiciary • The Media • Civil Society Organizations	Theoretical	Monthly Examinations and Final Examination
14-15	4	Explain the functions and roles of each institution within a democratic system. Discuss the challenges and obstacles to building and sustaining a democratic system.	Institutions of the Democratic System Challenges Facing Democrac	Theoretical	Monthly Examinations and Final Examination

11. Course development plan

- Update the course content in line with the latest national legislation and international conventions related to human rights and democracy.
- Link theoretical concepts with practical applications through case studies, classroom discussions, and practical activities.
- Diversify teaching and learning methods by incorporating interactive learning, presentations, e-learning, and collaborative learning.
- Promote a culture of human rights and the values of democracy, tolerance, citizenship, and respect for diversity among students.
- Enhance assessment methods to include written examinations, research papers, reports, presentations, and classroom participation.
- Encourage students to follow and critically analyze recent national and international developments in the field of human rights and democracy.
- Utilize modern technologies and digital resources to deliver course content and enrich the teaching and learning process.
- Conduct periodic reviews of the course based on feedback from students and faculty members, ensuring alignment with the academic program objectives and labor market requirements.

12. Course Evaluation

No	Evaluation methods	Calendar appointment week	degree	Relative % weight
1	Midterm Exam 1(theoretical)	The seventh week	30	30
2	Midterm Exam 2(theoretical)	The twelfth week	30	30
3	Coursework Marks	Coursework Marks	10	10
4	Final Coursework Mark	The final week (End of the course)	40	40
5	Final theoretical exam	Final semester exams	60	60
	the total	100	100%	100%

13.Infrastructure	
Classrooms, laboratories, and workshops	Available
Required prescribed textbooks	Available
Main References	**United Nations.** Universal Declaration of Human Rights (UDHR). 1948.
	United Nations. International Covenant on Civil and Political Rights (ICCPR). 1966.
	United Nations. International Covenant on Economic, Social and Cultural Rights (ICESCR). 1966.
	Constitution of the Republic of Iraq (2005), particularly the provisions related to human rights and
Recommended books and references (scientific journals, reports	Human Rights and Democracy, Professor Ali Aboudi Nehme
Electronic references, Internet sites	https://www.un.org/ https://www.ohchr.org

Course Description: **Arabic Language**

1. Course name	Arabic Language
2. code	NTU103
3. Available attendance forms	My presence
4. Semester/year	second semester /First year
5. Date this description was prepared	5/5/2026
6. Number of study hours/ Units	30 hours / Units 2
7. Course Instructor Name	Lecturer / Fahad turky moprd fahad-hti@ntu.edu.iq

8-Course objectives

- Enable students to understand the rules of the Arabic language and the principles of official correspondence and communication between governmental and institutional organizations.
- Introduce students to the Arabic language as the essence and symbol of cultural and national identity.
- Distinguish between language as a universal system of communication and dialect as a local form of speech.
- Develop students' ability to employ standard Arabic vocabulary in the academic writing of scientific research and formal documents.
- Enable students to write research papers and scientific articles accurately in Modern Standard Arabic (MSA).
- Help students avoid common writing errors and select appropriate and accurate vocabulary.
- Enrich students' Arabic vocabulary to enhance their communication skills and verbal competence.
- Familiarize students with selected examples of Arabic literature, both poetry and prose, to broaden their cultural and literary knowledge.
- Develop students' ability to write numbers correctly and prepare official letters and administrative requests in proper Arabic.
- Introduce students to Arabic phonetics and its relationship to the science of acoustics and physics.

9- Course outcomes and teaching, learning and evaluation methods

- Write correctly in Modern Standard Arabic, free from grammatical, spelling, and linguistic errors.
- Produce accurate academic and scientific writing using appropriate linguistic style and conventions.
- Use standard Arabic vocabulary correctly in both written and spoken communication.
- Expand linguistic knowledge by acquiring new vocabulary and understanding the meanings and proper usage of words.
- Demonstrate the ability to prepare official correspondence and administrative requests using correct formal Arabic.

10-Course structure					
the week	hours	Required learning outcomes	Name of the unit/topic	Teaching method	Evaluation method
1	2	Introduction	Introduction to Common Language Errors: The Closed Tā’ (ة), Open Tā’ (ت), and Long Tā’ Forms.	Theoretical lecture	Paper test + report
2	2	General Rules of the Arabic Language	Rules for Writing Alif (Maqṣūrah and Mamdūdah): The Solar and Lunar Letters.	Theoretical lecture	Paper test + report
3	2	Arabic Spelling (Orthography)	The Correct Use of the Letters Ḍād (ض) and Ẓā’ (ظ).	Theoretical lecture	Paper test + report
4	2	Arabic Spelling (Orthography)	Rules for Writing the Hamzah (ء).	Theoretical lecture	Paper test + report
5	2	Arabic Spelling (Orthography)	Punctuation Marks in Arabic Writing.	Theoretical lecture	Paper test + report
6	2	Fundamentals of Arabic Grammar	Nouns and Verbs: Identifying and Distinguishing Between Them.	Theoretical lecture	Paper test + report
7	2	Arabic Grammar	Objects in Arabic Grammar (Al-Mafā‘īl).	Theoretical lecture	Paper test + report
8	2	Arabic Grammar	Numbers and Their Grammatical Rules.	Theoretical lecture	Paper test + report
9-10	4	Arabic Grammar	Applications of Common Linguistic and Grammatical Errors.	Theoretical lecture	Paper test + report
11	2	Arabic Grammar	Nunation (Tanwīn), the Letter Nūn, and the Meanings of Arabic Prepositions.	Theoretical lecture	Paper test + report
12	2	Official Communication	Formal Structure of Administrative Correspondence.	Theoretical lecture	Paper test + report
13-14	4	Official Correspondence	Language and Style of Administrative Correspondence.	Theoretical lecture	Paper test + report
15	2	Official Letters and Administrative Correspondence	Samples of Official and Administrative Correspondence.	Theoretical lecture	Paper test + report

11. Course development plan

- Continuously update the curriculum to keep pace with recent developments in Arabic grammar and modern methods of teaching the Arabic language.
- Organize scientific seminars and workshops in collaboration with specialists in the Arabic language to discuss recent linguistic and educational developments.
- Monitor linguistic and social developments affecting the use of the Arabic language and incorporate them into the course content to enhance students' linguistic competence and communication skills.

12. Course Evaluation

No	Evaluation methods	Calendar appointment week	degree	Relative % weight
1	Midterm Exam 1(theoretical)	The seventh week	30	30
2	Midterm Exam 2(theoretical)	The twelfth week	30	30
3	Coursework Marks	Coursework Marks	10	10
4	Final Coursework Mark	The final week (End of the course)	40	40
5	Final theoretical exam	Final semester exams	60	60
	the total	100	100%	100%

13.Infrastructure	
Classrooms, laboratories, and workshops	Available
Required prescribed textbooks	Principles of Arabic Grammar
Main References	A Comprehensive Arabic Grammar
Recommended books and references (scientific journals, reports	The Arabic Tongue Journal
Electronic references, Internet sites	https://brill.com/view/journals/mrkz/mrkz-overview.xml

Course Description: **Automotive Bodywork1**

1. Course name	Automotive Bodywork1
2. code	PMTA217
3. Available attendance forms	My presence
4. Semester/year	First semester / second year
5. Date this description was prepared	5/5/2026
6. Number of study hours/ Units	45 hours / Units 3
7. Course Instructor Name	Lecturer / Essa Ahmed Essa essa_hwj@ntu.edu.iq

8-Course objectives

- Enable students to understand the importance of automotive body repair and keep pace with developments in this field.
- Enable students to recognize the importance of using modern materials to achieve the optimal use of time, effort, and resources.
- Familiarize students with the available alternatives and modern techniques used in automotive body repair.
- Enable students to understand the methods of operating and using automotive body repair equipment and tools correctly.
- Develop students' ability to carry out replacement operations for damaged vehicle body parts safely and efficiently.
- Develop students' ability to perform repair procedures for damaged vehicle body components using appropriate repair techniques.

9- Course outcomes and teaching, learning and evaluation methods

- Perform replacement procedures for damaged vehicle body parts safely and efficiently.
- Carry out repair procedures for damaged automotive body components using appropriate repair techniques.
- Identify the materials used in automotive body manufacturing and understand their

properties.

- Recognize the required tests and inspection procedures used to evaluate automotive body materials.
- Identify the available materials and repair alternatives used in automotive body maintenance.
- Demonstrate the correct use of automotive body repair tools and equipment.

10-Course structure

the week	hours	Required learning outcomes	Name of the unit/topic	Teaching method	Evaluation method
1	3	Introduction to the History and Development of Automobiles.	Automobile Manufacturing	Lecture + Educational Videos + Workshop	Daily Quizzes + Practical Tests + Final Examination
2	3	Overview of Automotive Body and Chassis Manufacturing: Vehicle body construction and different body and chassis designs.	Automotive Body and Chassis Manufacturing	Lecture + Educational Videos + Workshop	Daily Quizzes + Practical Tests + Final Examination
3-4	6	Engineering Materials Used in Automotive Body and Chassis Manufacturing: Ferrous and non-ferrous materials, their types, specifications, and applications.	Engineering Materials	Lecture + Educational Videos + Workshop	Daily Quizzes + Practical Tests + Final Examination
5	3	Properties of Engineering Materials: Physical properties, mechanical properties, brittleness, and mechanical testing methods.	Properties of Engineering Materials	Lecture + Educational Videos + Workshop	Daily Quizzes + Practical Tests + Final Examination
6	3	Introduction to Stress and Strain.	Simple Stress and Strain	Lecture + Educational	Daily Quizzes + Practical Tests

				Videos + Workshop	+ Final Examination
7	3	Direct (Normal) Stress and Direct Strain.	Direct Stress and Direct Strain	Lecture + Educational Videos + Workshop	Daily Quizzes + Practical Tests + Final Examination
8	3	Elastic Materials and Hooke's Law.	Hooke's Law	Lecture + Educational Videos + Workshop	Daily Quizzes + Practical Tests + Final Examination
9	3	Modulus of Elasticity (Young's Modulus).	Modulus of Elasticity (Young's Modulus)	Lecture + Educational Videos + Workshop	Daily Quizzes + Practical Tests + Final Examination
10	3	Tensile Test: Stress–strain diagram and interpretation of material behavior.	Stress–Strain Diagram	Lecture + Educational Videos + Workshop	Daily Quizzes + Practical Tests + Final Examination
11	3	Simple Engineering Problems and Calculations Related to Stress and Strain.	Engineering Problems and Applications	Lecture + Educational Videos + Workshop	Daily Quizzes + Practical Tests + Final Examination
12	3	Electric Arc Welding: Arc initiation and arc re-ignition techniques.	Electric Arc Welding	Lecture + Educational Videos + Workshop	Daily Quizzes + Practical Tests + Final Examination
13	3	Resistance Welding: Spot welding principles and applications.	Resistance Welding	Lecture + Educational Videos + Workshop	Daily Quizzes + Practical Tests + Final Examination
14-15	6	Gas Welding: Heat sources, oxy-acetylene welding equipment, oxy-acetylene torch, and types of welding flames.	Gas Welding	Lecture + Educational Videos + Workshop	Daily Quizzes + Practical Tests + Final Examination

11 . Course development plan

- Establish modern workshops equipped with advanced tools, equipment, and repair devices to enhance students' practical skills.
- Provide carefully selected educational videos to reinforce modern automotive body repair techniques and procedures.
- Organize field visits to automotive body manufacturing plants and repair facilities to expose students to current industrial practices and technologies.

12. Course Evaluation

No	Evaluation methods	Calendar appointment week	degree	Relative % weight
1	Midterm Exam 1(theoretical)	The seventh week	10	10
2	Midterm Exam 1(practical)	The seventh week	10	10
3	Midterm Exam 2(theoretical)	The twelfth week	10	10
4	Midterm Exam 2(practical)	The twelfth week	10	10
5	Coursework Marks	Coursework Marks	10	10
6	Final Coursework Mark	The final week (End of the course)	50	50
7	Final practical exam	Final semester exams	10	10
8	Final theoretical exam	Final semester exams	40	40
The Total		100	100%	100%

13.Infrastructure	
Classrooms, laboratories, and workshops	Available
Required prescribed textbooks	Automotive Body Repair
Main References	Automotive Body Repair – Asst. Prof. Waleed Al-Jarrah
Recommended books and references (scientific journals, reports	• Manufacturing Processes – Dr. Arif Abu Safiya, University of Technology. • Strength of Materials – Dr. Wajeeh Mohammed Al-Dakhani. • Automotive Components Technology – Dr. Sami Mohsen, Technical Education Authority.
Electronic references, Internet sites	• Specialized scientific books in Automotive Body Repair and Vehicle Body Engineering. • Scientific journals and technical publications related to automotive body manufacturing, repair technologies, welding, and engineering materials. • Technical reports and manuals issued by automobile manufacturers and automotive engineering organizations.

Course Description: **Automotive Bodywork 2**

1. Course name	Automotive Bodywork 2
2. code	PMTA218
3. Available attendance forms	My presence
4. Semester/year	second semester / second year
5. Date this description was prepared	5/5/2026
6. Number of study hours/ Units	45 hours / Units 3
7. Course Instructor Name	Lecturer / Essa Ahmed Essa essa_hwj@ntu.edu.iq

8-Course objectives

- Introduce students to the fundamentals of automotive body structures.
- Familiarize students with the different types of automotive bodies and their characteristics.
- Introduce students to the materials used in automotive body manufacturing and their properties.
- Enable students to identify the causes of vehicle body damage and understand the appropriate repair methods.
- Familiarize students with the methods of protecting automotive bodies from environmental and external factors.

9- Course outcomes and teaching, learning and evaluation methods

- Recognize the importance of automotive body technology and keep pace with recent developments in the field.
- Understand the importance of using modern materials to optimize time, effort, and resources in automotive body repair and manufacturing.
- Identify the materials used in automotive body manufacturing and understand their characteristics and applications.
- Recognize the required tests and inspection methods used to evaluate automotive body materials.

- Identify the available repair materials, methods, and alternatives used in automotive body maintenance.
- Demonstrate an understanding of the correct operation and use of automotive body repair tools and equipment.

10-Course structure

the week	hours	Required learning outcomes	Name of the unit/topic	Teaching method	Evaluation method
1	3	Riveted Joints: Types of riveted joints (lap joints and butt joints), tensile strength of rivets, and solved engineering problems.	Riveted Joints	Lecture + Educational Videos + Workshop	Daily Quizzes + Practical Tests + Final Examination
2	3	Comparison Between Welded and Riveted Joints: Advantages and disadvantages of each joining method.	Welded Joints and Riveted Joints	Lecture + Educational Videos + Workshop	Daily Quizzes + Practical Tests + Final Examination
3-4	6	Robots in the Automotive Industry: Advantages of robots over manual labor and their applications in automobile manufacturing.	Robotics in Automotive Manufacturing	Lecture + Educational Videos + Workshop	Daily Quizzes + Practical Tests + Final Examination
5-6	6	Metal Forming Processes: Cold working and cold forming operations, their types, and hot working and hot forming processes.	Metal Forming	Lecture + Educational Videos + Workshop	Daily Quizzes + Practical Tests + Final Examination
7	3	Automotive Chassis Design: Study of vehicle chassis structures and design concepts.	Automotive Body Design	Lecture + Educational Videos + Workshop	Daily Quizzes + Practical Tests + Final Examination
8	3	Corrosion: The effects of corrosion, weather conditions, and environmental factors on	Corrosion	Lecture + Educational Videos + Workshop	Daily Quizzes + Practical Tests + Final Examination

		automotive bodies.			
9	3	Automotive Painting: Surface preparation, cleaning, and removal of corroded or damaged sections before painting.	Automotive Painting	Lecture + Educational Videos + Workshop	Daily Quizzes + Practical Tests + Final Examination
10	3	Phosphating, Priming, Body Filler Application, and Surface Finishing.	Painting	Lecture + Educational Videos + Workshop	Daily Quizzes + Practical Tests + Final Examination
11	3	Automotive Paints: Types of paints, color mixing techniques, and color matching according to standard color charts.	Primer Coating	Lecture + Educational Videos + Workshop	Daily Quizzes + Practical Tests + Final Examination
12	3	Painting Processes in Automotive Manufacturing Plants.	Painting Techniques	Lecture + Educational Videos + Workshop	Daily Quizzes + Practical Tests + Final Examination
13	3	Final Polishing and Finishing Operations.	Polishing Operations	Lecture + Educational Videos + Workshop	Daily Quizzes + Practical Tests + Final Examination
14	6	Paint Defects: Diagnosis, causes, and repair methods.	Paint Defects and Coating Problems	Lecture + Educational Videos + Workshop	Daily Quizzes + Practical Tests + Final Examination
15	3	Automotive Glass: Types of vehicle glass and the repair and installation of windshield, rear, and side windows.	Automotive Body Repair Operations	Lecture + Educational Videos + Workshop	Daily Quizzes + Practical Tests + Final Examination

11 . Course development plan

- Establish modern workshops equipped with advanced tools, equipment, and repair devices to enhance students' practical skills.
- Provide carefully selected educational videos to reinforce modern techniques and methods used in automotive body repair and restoration.
- Organize field visits to automotive body manufacturing plants and repair workshops to familiarize students with current industrial practices and technologies.

12. Course Evaluation

No	Evaluation methods	Calendar appointment week	degree	Relative % weight
1	Midterm Exam 1(theoretical)	The seventh week	10	10
2	Midterm Exam 1(practical)	The seventh week	10	10
3	Midterm Exam 2(theoretical)	The twelfth week	10	10
4	Midterm Exam 2(practical)	The twelfth week	10	10
5	Coursework Marks	Coursework Marks	10	10
6	Final Coursework Mark	The final week (End of the course)	50	50
7	Final practical exam	Final semester exams	10	10
8	Final theoretical exam	Final semester exams	40	40
The Total		100	100%	100%

13.Infrastructure	
Classrooms, laboratories, and workshops	Available
Required prescribed textbooks	Automotive Body Repair
Main References	Automotive Body Repair – Asst. Prof. Waleed Al-Jarrah
Recommended books and references (scientific journals, reports	• Manufacturing Processes – Dr. Arif Abu Safiya, University of Technology. • Strength of Materials – Dr. Wajeeh Mohammed Al-Dakhani. • Automotive Components Technology – Dr. Sami Mohsen, Technical Education Authority.
Electronic references, Internet sites	• Specialized scientific books in Automotive Body Repair and Vehicle Body Engineering. • Scientific journals and technical publications related to automotive body manufacturing, repair technologies, welding, and engineering materials. • Technical reports and manuals issued by automobile manufacturers and automotive engineering organizations.

Course Description: **English language2**

1. Course name	**English language2**
2. code	NTU200
3. Available attendance forms	My presence
4. Semester/year	First Semester / second year
5. Date this description was prepared	5/5/2026
6. Number of study hours/ Units	30 hours / Units 2
7. Course Instructor Name	Assistant Lecturer / Mohammed Medhat Mohammed mohammedaldabbagh@ntu.edu.iq

8-Course objectives

- Develop students' proficiency in the four fundamental language skills: **listening, speaking, reading, and writing**.
- Strengthen students' understanding and accurate use of **intermediate English grammar** in both spoken and written communication.
- Expand students' vocabulary and improve their ability to use appropriate expressions in academic, professional, and everyday contexts.
- Enhance students' reading comprehension skills through the analysis of a variety of texts related to general and professional topics.
- Improve students' writing skills by enabling them to produce coherent paragraphs, short essays, reports, and formal correspondence.
- Develop students' oral communication skills through discussions, presentations, and interactive classroom activities.
- Encourage students to use English confidently for academic purposes and in real-life communication.
- Promote independent learning through the effective use of dictionaries, academic

references, and digital learning resources.

- Prepare students to use English effectively in their field of study and future professional careers.
- Foster critical thinking, collaboration, and lifelong learning through English language activities and projects.

9- Course outcomes and teaching, learning and evaluation methods

A. Course Learning Outcomes

Upon successful completion of this course, students will be able to:

A1. Demonstrate an intermediate level of proficiency in listening, speaking, reading, and writing in English.

A2. Apply intermediate English grammar accurately in spoken and written communication.

A3. Use a wider range of vocabulary and expressions appropriately in academic, professional, and everyday situations.

A4. Read and comprehend intermediate-level texts and identify their main ideas and supporting details.

A5. Write well-organized paragraphs, short essays, reports, and formal correspondence using appropriate grammar and vocabulary.

A6. Communicate effectively through discussions, presentations, and collaborative classroom activities.

A7. Employ critical thinking skills when analyzing, interpreting, and responding to written and spoken English texts.

Teaching and Learning Methods

- Interactive lectures.
- Group discussions and pair-work activities.
- Reading comprehension exercises.
- Writing workshops and guided writing tasks.
- Listening and speaking practice using audio and video materials.
- Student presentations and classroom discussions.
- E-learning activities and online learning platforms.
- Individual and group assignments.
- Problem-solving and communicative language activities.

Assessment Methods

- Daily classroom participation and discussion.
- Weekly quizzes.
- Homework assignments and writing tasks.
- Reading comprehension exercises.
- Oral presentations and speaking assessments.
- Midterm examination.
- Final examination.
- Continuous assessment of students' language performance throughout the semester.

10-Course structure					
the week	hours	Required learning outcomes	Name of the unit/topic	Teaching method	Evaluation method
1	2	The student understood the lecture	Numbers and possessive pronouns	Theoretical lecture	discussion + Paper test
2	2	The student understood the lecture	Numbers , pronouns and countries	Theoretical lecture	discussion + Paper test
3	2	The student understood the lecture	Personal and general questions	Theoretical lecture	discussion + Paper test
4	2	The student understood the lecture	The family and its members	Theoretical lecture	discussion + Paper test
5	2	The student understood the lecture	Sports, food and drinks	Theoretical lecture	discussion + Paper test
6	2	The student understood the lecture	Languages and nationalities	Theoretical lecture	discussion + Paper test
7	2	The student understood the lecture	Time , days and hours	Theoretical lecture	discussion + Paper test
8	2	The student understood the lecture	Simple present	Theoretical lecture	discussion + Paper test
9	2	The student understood the lecture	The simple past, years, and years	Theoretical lecture	discussion + Paper test
10	2	The student understood the lecture	Questions and sentence negation 12 3 English	Theoretical lecture	discussion + Paper test
11	2	The student understood the lecture	and adverbs in English	Theoretical lecture	discussion + Paper test
12	2	The student understood the lecture	Signs And trends around us	Theoretical lecture	discussion + Paper test
13	2	The student understood the lecture	Admiration in the English language	Theoretical lecture	discussion + Paper test
14	2	The student understood the lecture	Trips And exploration	Theoretical lecture	discussion + Paper test
15	2	The student understood the lecture	Social problems	Theoretical lecture	discussion + Paper test

11. Course development plan

- Continuously update the course content to align with recent developments in English language teaching methodologies and international language proficiency standards.
- Integrate modern teaching strategies such as interactive learning, blended learning, project-based learning, and communicative language teaching.
- Enhance the use of digital technologies by incorporating e-learning platforms, multimedia resources, language learning applications, and virtual classrooms.
- Develop students' practical language skills through authentic listening, speaking, reading, and writing activities related to academic and professional contexts.
- Diversify assessment methods to include quizzes, presentations, projects, writing assignments, oral communication tasks, and continuous classroom assessment.
- Encourage independent learning by promoting the effective use of online dictionaries, digital libraries, academic databases, and self-learning resources.
- Strengthen communication skills through classroom discussions, debates, collaborative learning, and real-life language practice.
- Conduct periodic reviews of the course based on feedback from students, faculty members, and stakeholders to ensure alignment with program learning outcomes and labor market requirements.

12. Course Evaluation

No	Evaluation methods	Calendar appointment week	degree	Relative % weight
1	Midterm Exam 1(theoretical)	The seventh week	30	30
2	Midterm Exam 2(theoretical)	The twelfth week	30	30
3	Coursework Marks	Coursework Marks	10	10
4	Final Coursework Mark	The final week (End of the course)	40	40
5	Final theoretical exam	Final semester exams	60	60
The Total		100	100%	100%

13.Infrastructure	
Classrooms, laboratories, and workshops	Available
Required prescribed textbooks	Available
Main References	1- Newheadway Plus, Beginner Student's book by John & Liz Soars. Oxford. 2- Newheadway Plus, Beginner Workbook by John & Liz Soars. Oxford.
Recommended books and references (scientific journals, reports	3- Basic English Grammar by Betty Azar. 4- Oxford Picture Dictionary.
Electronic references, Internet sites	BBC Learning English, British Council Learn English

Course Description: **Automotive Electrical and electronics1**

1. Course name	Automotive Electrical and electronics1
2. code	PMTA228
3. Available attendance forms	My presence
4. Semester/year	First Semester / second year
5. Date this description was prepared	5/5/2026
6. Number of study hours/ Units	45 hours / Units 3
7. Course Instructor Name	Lecturer / Jasim Ibrahim Musa jasim_hwj@ntu.edu.iq

8-Course objectives

- Demonstrate a comprehensive understanding of the principles and operating mechanisms of automotive electrical and electronic systems.
- Correctly use electrical and electronic testing, measuring, and diagnostic equipment to inspect and troubleshoot automotive electrical and electronic systems.
- Perform inspection, preventive maintenance, and routine servicing of automotive electrical and electronic systems in accordance with standard technical procedures.
- Identify and interpret the symbols, terminology, wiring diagrams, and electrical and electronic components used in automotive systems.
- Inspect and test electrical and electronic components to determine their operational condition and serviceability.

9- Course outcomes and teaching, learning and evaluation methods

1. Acquire the electrical skills required to inspect, test, and diagnose the electrical and electronic components of automotive systems.

2. Develop the practical skills necessary to perform routine maintenance and repair of automotive electrical system components in accordance with standard technical procedures.

3. Correctly use modern diagnostic equipment and technologies to detect and troubleshoot faults in automotive electrical and electronic systems.

A. Cognitive Objectives

A1. Understand the fundamental principles and operating concepts of automotive electrical and electronic systems.

A2. Identify the major electrical and electronic components, symbols, wiring diagrams, and circuits used in automobiles.

A3. Explain the functions and operating principles of automotive electrical systems, including the battery, charging system, starting system, ignition system, and lighting circuits.

A4. Recognize the properties and applications of electrical and electronic components used in modern vehicles.

A5. Develop an understanding of basic diagnostic principles and safety procedures related to automotive electrical and electronic systems.

B. Course-Specific Skill Objectives

B1. Perform inspection, testing, and diagnosis of automotive electrical and electronic components using appropriate tools and instruments.

B2. Carry out routine maintenance and repair procedures for automotive electrical systems according to standard technical practices.

B3. Correctly use modern diagnostic equipment and electronic testing devices to detect and troubleshoot electrical and electronic faults.

B4. Read and interpret automotive electrical wiring diagrams and technical service information.

B5. Apply safety procedures while working with automotive electrical and electronic systems.

Teaching and Learning Methods

- Interactive lectures.
- Practical laboratory and workshop sessions.
- Demonstrations using automotive electrical training units.
- Hands-on diagnostic and troubleshooting exercises.
- Group discussions and problem-solving activities.
- Student practical assignments and projects.
- Multimedia presentations and educational videos.
- Field visits to automotive maintenance workshops (where applicable).

Assessment Methods

- Daily quizzes.
- Practical laboratory tests.
- Written examinations.
- Oral examinations.
- Workshop performance assessment.
- Homework assignments and technical reports.
- Midterm examination.
- Final examination.

C. Affective and Value-Based Objectives

C1. Foster commitment to safety regulations and professional ethics while working on automotive electrical systems.

C2. Develop responsibility, accuracy, and attention to detail during inspection, maintenance, and repair activities.

C3. Encourage teamwork and effective communication in laboratory and workshop environments.

C4. Promote continuous learning and awareness of technological developments in automotive electrical and electronic systems.

Teaching and Learning Methods

- Practical workshop training.
- Supervised laboratory activities.
- Team-based maintenance projects.
- Discussions of real-life case studies.
- Demonstrations using modern diagnostic equipment.
- Guided practical exercises.

Assessment Methods

- Observation of practical performance.
- Continuous practical assessment.
- Oral questioning.
- Evaluation of laboratory reports.
- Participation in workshop activities.
- Practical examinations.

D. General and Transferable Skills (Employability and Personal Development)

D1. Develop technical problem-solving and fault diagnosis skills.

D2. Enhance the ability to use technical manuals, wiring diagrams, and electronic databases effectively.

D3. Improve communication, teamwork, and professional reporting skills.

D4. Develop competence in using modern automotive diagnostic equipment and digital technologies.

D5. Promote lifelong learning and adaptability to technological advances in the automotive industry.

10-Course structure					
the week	hours	Required learning outcomes	Name of the unit/topic	Teaching method	Evaluation method
1-2	6	Charging System (DC): Direct current charging system, DC generator, voltage regulator, generator components, and principle of operation.	Charging System	Lecture + Educational Videos + Laboratory	Daily Quizzes
3	3	Maintenance and Fault Diagnosis of the DC Generator: Inspection, testing, and troubleshooting using specialized diagnostic equipment.	DC Generator (DC)	Lecture + Educational Videos + Laboratory	Daily Quizzes
4	3	DC Voltage Regulator: Components, operating principles, maintenance, and fault diagnosis.	DC Voltage Regulator	Lecture + Educational Videos + Laboratory	Daily Quizzes
5	3	Alternator (AC Generator): Components, operating principles, and construction.	AC Generator (Alternator)	Lecture + Educational Videos + Laboratory	Daily Quizzes
6	3	Alternator Charging System: Common faults, diagnostic procedures, repair methods, and comparison between DC generators and AC alternators.	Alternator Charging System	Lecture + Educational Videos + Laboratory	Daily Quizzes
7	3	Alternator Voltage Regulators: Types, operating principles, and applications.	AC Voltage Regulator	Lecture + Educational Videos + Laboratory	Daily Quizzes
8	3	Armature Winding: Principles and procedures for armature winding.	Armature	Lecture + Educational Videos + Laboratory	Daily Quizzes
9-10	6	Conventional Ignition System: Components including the battery, ignition switch, ignition coil, distributor, spark plugs, and ignition wires.	Ignition System	Lecture + Educational Videos + Laboratory	Daily Quizzes
11-12	6	Service and Maintenance of the Ignition System: Inspection and testing of the ignition coil, condenser, distributor, ignition timing adjustment, and troubleshooting procedures.	Ignition System Maintenance	Lecture + Educational Videos + Laboratory	Daily Quizzes

13	3	Using an Oscilloscope for testing and analyzing the automotive ignition system.	Oscilloscope	Lecture + Educational Videos + Laboratory	Daily Quizzes
14	3	Testing Voltage and Current Regulators using specialized diagnostic equipment.	Voltage and Current Regulator Tester	Lecture + Educational Videos + Laboratory	Daily Quizzes
15	3	Using a Distributor Tester to inspect, test, and evaluate the operational condition of the ignition distributor.	Electrical Diagnostic Equipment	Lecture + Educational Videos + Laboratory	Daily Quizzes

11 . Course development plan

- Expand the course content in Automotive Electronics, beginning with the study of semiconductors and electronic components used in automotive electrical systems, and progressing to the analysis of electronic circuits and control systems employed in modern vehicles.
- Keep pace with the rapid technological advancements in the automotive industry, particularly in the fields of electronic ignition systems, electronic fuel injection (EFI) systems, and other modern automotive electronic technologies.
- Develop practical training boards and simulation panels that replicate actual automotive electrical and electronic systems to enhance students' practical skills in diagnosis, testing, maintenance, and troubleshooting.

12. Course Evaluation

No	Evaluation methods	Calendar appointment week	degree	Relative % weight
1	Midterm Exam 1(theoretical)	The seventh week	10	10
2	Midterm Exam 1(practical)	The seventh week	10	10
3	Midterm Exam 2(theoretical)	The twelfth week	10	10
4	Midterm Exam 2(practical)	The twelfth week	10	10
5	Coursework Marks	Coursework Marks	10	10
6	Final Coursework Mark	The final week (End of the course)	50	50
7	Final practical exam	Final semester exams	10	10
8	Final theoretical exam	Final semester exams	40	40
The Total		100	100%	100%

13. Infrastructure

Classrooms, laboratories, and workshops	Available
Required prescribed textbooks	Automotive Electrical Systems Automotive Electronics Automotive Electricity and Electronics
Main References	1- AUTOELECTRICAL& ELECTRONIC SYSTEM. 2-MODERN AUTOMOTIVE ELECTRICITY
Recommended books and references (scientific journals, reports	ADVAANCED AUTOMOTIVE TECHNOLO
Electronic references, Internet sites	WWW.EDEC.WORKSHAP

Course Description: **Automotive Electrical and electronics2**

1. Course name	Automotive Electrical and electronics2
2. code	PMTA229
3. Available attendance forms	My presence
4. Semester/year	second Semester / second year
5. Date this description was prepared	5/5/2026
6. Number of study hours/ Units	45 hours / Units 3
7. Course Instructor Name	Lecturer / Jasim Ibrahim Musa jasim_hwj@ntu.edu.iq

8-Course objectives

- Demonstrate a comprehensive understanding of the principles and operating mechanisms of automotive electrical and electronic systems.
- Correctly use electrical and electronic testing and diagnostic equipment to inspect and troubleshoot faults in automotive electrical and electronic systems.
- Perform inspection, preventive maintenance, and routine servicing of automotive electrical and electronic systems in accordance with standard technical procedures.
- Identify and interpret the symbols, terminology, wiring diagrams, and electrical and electronic components used in automotive electrical and electronic systems.
- Inspect and test automotive electrical and electronic components to determine their operational condition and serviceability.

9- Course outcomes and teaching, learning and evaluation methods

- Design and implement basic electrical and electronic circuits used in automotive systems.
- Perform inspection and testing of electrical and electronic components to determine their operational condition and serviceability.
- Acquire both theoretical knowledge and practical skills related to automotive electrical and electronic systems.

- Compare electrical and electronic components in terms of performance, efficiency, and response characteristics.
- Apply systematic troubleshooting techniques to identify and solve electrical and electronic faults in automotive systems.
- Develop the practical skills required to inspect, test, and diagnose automotive electrical and electronic components and systems.
- Perform routine maintenance and repair of automotive electrical systems in accordance with standard technical procedures.
- Correctly use modern diagnostic equipment and technologies to detect, analyze, and troubleshoot faults in automotive electrical and electronic systems.

10-Course structure

the week	hours	Required learning outcomes	Name of the unit/topic	Teaching method	Evaluation method
1	3	Modern Ignition Timing Tester: Applications and ignition timing adjustment.	Ignition Timing Tester	Lecture + Educational Videos + Laboratory	Daily Quizzes
2	3	Infrared Exhaust Emission Tester: Using an infrared exhaust emission analyzer to evaluate exhaust gases, assess spark plug performance, and diagnose ignition system faults.	Infrared Exhaust Emission Tester	Lecture + Educational Videos + Laboratory	Daily Quizzes
4-3	6	Electronic Ignition System.	Electronic Ignition System	Lecture + Educational Videos + Laboratory	Daily Quizzes
5	3	Vehicle Lighting System: Side, head, and interior lighting systems.	Vehicle Lighting System	Lecture + Educational Videos + Laboratory	Daily Quizzes
6	3	Auxiliary Electrical Components: Turn signal flasher unit, electronic	Turn Signal Flasher Unit	Lecture + Educational Videos + Laboratory	Daily Quizzes

		lighting control module, windshield wiper system, and electric fuel pump.			
7	3	Diagnosis and Repair of Lighting System Faults: Front, rear, side, and interior lighting systems.	Lighting System Fault Diagnosis	Lecture + Educational Videos + Laboratory	Daily Quizzes
9-8	6	Auxiliary Electrical Systems in Automobiles.	Auxiliary Electrical Systems	Lecture + Educational Videos + Laboratory	Daily Quizzes
10-11	6	Secondary Electrical Circuits in the Vehicle.	Secondary Electrical Circuits	Lecture + Educational Videos + Laboratory	Daily Quizzes
12	3	Electrical Control Systems for Vehicle Doors and Windows.	Electrical Door and Window Control System	Lecture + Educational Videos + Laboratory	Daily Quizzes
13	3	Automotive Air Conditioning and Heating Systems: Electrical components and operating principles.	Automotive Air Conditioning System	Lecture + Educational Videos + Laboratory	Daily Quizzes
14	3	Vehicle Alarm System and Electronic Control System.	Vehicle Alarm and Electronic Control System	Lecture + Educational Videos + Laboratory	Daily Quizzes
15	3	Using an Oscilloscope: Testing and analyzing engine performance and electrical signal waveforms.	Oscilloscope	Lecture + Educational Videos + Laboratory	Daily Quizzes

11 . Course development plan

- Expand the course content to cover advanced automotive electronics, beginning with semiconductors and electronic components used in automotive electrical systems, and progressing to the analysis of electronic circuits and control systems in modern vehicles.
- Keep pace with the rapid technological developments in the automotive industry, particularly in electronic ignition systems, electronic fuel injection (EFI) systems, and other advanced automotive electronic technologies.
- Develop modern electrical and electronic training boards and simulation panels that replicate actual automotive systems to enhance students' practical skills in testing, diagnosis, maintenance, and troubleshooting.

12. Course Evaluation

No	Evaluation methods	Calendar appointment week	degree	Relative % weight
1	Midterm Exam 1(theoretical)	The seventh week	10	10
2	Midterm Exam 1(practical)	The seventh week	10	10
3	Midterm Exam 2(theoretical)	The twelfth week	10	10
4	Midterm Exam 2(practical)	The twelfth week	10	10
5	Coursework Marks	Coursework Marks	10	10
6	Final Coursework Mark	The final week (End of the course)	50	50
7	Final practical exam	Final semester exams	10	10
8	Final theoretical exam	Final semester exams	40	40
The Total		100	100%	100%

13. Infrastructure	
Classrooms, laboratories, and workshops	Available
Required prescribed textbooks	Automotive Electrical Systems Automotive Electronics Automotive Electricity and Electronics
Main References	1- AUTOELECTRICAL& ELECTRONIC SYSTEM. 2-MODERN AUTOMOTIVE ELECTRICITY
Recommended books and references (scientific journals, reports	ADVAANCED AUTOMOTIVE TECHNOLO
Electronic references, Internet sites	WWW.EDEC.WORKSHAP

Course Description: **Engineering Drawing 1**

1. Course name	Engineering Drawing 1
2. code	PMTA127
3. Available attendance forms	My presence
4. Semester/year	First year /first semester
5. Date this description was prepared	5/5/2026
6. Number of study hours/ Units	45 hours / Units 3
7. Course Instructor Name	Lecturer / Essa Ahmed Essa essa_hwj@ntu.edu.iq

8-Course objectives

Upon successful completion of this course, students will be able to:

- Develop the skills required to use AutoCAD for drawing engineering constructions, geometric shapes, and mechanical drawings accurately.
- Understand the fundamental principles, standards, and conventions of engineering drawing.
- Become familiar with computer-aided drafting (CAD) concepts and effectively use AutoCAD software to produce technical drawings.

9- Course outcomes and teaching, learning and evaluation methods

- Demonstrate proficiency in using AutoCAD software to produce accurate engineering drawings.
- Develop the ability to prepare engineering drawings and generate orthographic projections in accordance with engineering drawing standards.
- Acquire the skills required to produce perspective drawings and apply sectional views correctly.
- Appreciate the importance of engineering drawing as a fundamental means of

communication between engineering and design disciplines.

- Demonstrate discipline, organization, and professionalism during classroom and laboratory activities.
- Recognize the significance of engineering drawing as a fundamental subject in engineering education and professional practice.

10-Course structure

the week	hours	Required learning outcomes	Name of the unit/topic	Teaching method	Evaluation method
1	3	Introduction to Engineering Drawing and AutoCAD software.	Engineering Drawing and AutoCAD	Lecture + Laboratory	Daily Quizzes
2	3	Lettering and Numbering in both Arabic and English according to engineering drawing standards.	Fundamentals of Engineering Drawing	Lecture + Laboratory	Daily Quizzes
3	3	Types of Engineering Drawing Lines, projection methods, text formatting, and construction of an arc with a given radius tangent to a given circle and a straight line.	Engineering Drawing Shapes	Lecture + Laboratory	Daily Quizzes
4	3	Construction of Regular Polygons and applications of basic geometric constructions.	Geometric Shapes	Lecture + Laboratory	Daily Quizzes
5	3	Development of Simple Geometric Solids (cylinder, cone, and pyramid) and methods of drawing simple perspective views.	Geometric Constructions and Dimensioning	Lecture + Laboratory	Daily Quizzes
6	3	Dimensioning Techniques in engineering drawing and construction of the perspective of a circle	Dimensioning	Lecture + Laboratory	Daily Quizzes

		(ellipse).			
7	3	Complex Perspective Drawing techniques.	Perspective Drawing	Lecture + Laboratory	Daily Quizzes
8	3	Theory of Orthographic Projection and drawing the three principal views of relatively complex objects.	Theory of Projection	Lecture + Laboratory	Daily Quizzes
9	3	Drawing orthographic projections of complex perspective objects.	Orthographic Projection	Lecture + Laboratory	Daily Quizzes
10	3	Constructing a perspective view from two orthographic views and determining the third view.	Determination of Orthographic Views	Lecture + Laboratory	Daily Quizzes
11	3	Theory of Sectioning in engineering drawing and its practical applications.	Theory of Sectioning	Lecture + Laboratory	Daily Quizzes
12	3	Drawing orthographic views from complex perspective drawings.	Theory of Projection	Lecture + Laboratory	Daily Quizzes
13	3	Drawing sectional perspective views using different cutting planes and directions.	Theory of Sectioning	Lecture + Laboratory	Daily Quizzes
14-15	6	Preparing a complete engineering drawing sheet including the perspective view, orthographic projections, and sectional views.	Theory of Sectioning	Lecture + Laboratory	Daily Quizzes

11 . Course development plan

- Expand the course content to provide advanced training in AutoCAD, enabling students to utilize a wider range of computer-aided design (CAD) tools and features for engineering applications.
- Keep pace with technological developments in engineering drawing by enhancing students' ability to prepare accurate engineering drawings and generate orthographic projections using modern CAD techniques.
- Strengthen students' practical skills in perspective drawing and sectional views through advanced exercises and practical applications using AutoCAD and engineering drawing standards.

12. Course Evaluation

No	Evaluation methods	Calendar appointment week	degree	Relative % weight
1	Midterm Exam 1(theoretical)	The seventh week	10	10
2	Midterm Exam 1(practical)	The seventh week	10	10
3	Midterm Exam 2(theoretical)	The twelfth week	10	10
4	Midterm Exam 2(practical)	The twelfth week	10	10
5	Coursework Marks	Coursework Marks	10	10
6	Final Coursework Mark	The final week (End of the course)	50	50
7	Final theoretical exam	Final semester exams	50	50
The Total		100	100%	100%

13.Infrastructure	
Classrooms, laboratories, and workshops	Available
Required prescribed textbooks	Engineering Drawing. AutoCAD: A Problem-Solving Approach.
Main References	Engineering Drawing and Design – David A. Madsen & David P. Madsen. Technical Drawing with Engineering Graphics – Frederick E. Giesecke et al.
Recommended books and references (scientific journals, reports	International journals in engineering graphics and computer-aide design (CAD). Technical reports and manuals related to engineering drawing an AutoCAD applications. Engineering drawing standards (ISO, ANSI).
Electronic references, Internet sites	Autodesk Education (AutoCAD Learning Resources). Autodesk Knowledge Network. AutoCAD Official Documentation and Tutorials. Engineering graphics and CAD educational websites.

Course Description: **Automotive Engines Maintenance1**

1. Course name	Automotive Engines maintenance1
2. code	PMTA120
3. Forms of attendance available	My presence
4. Semester/year	First year / first semester
5. Date this description was prepared	5/5/2026
6. Number of study hours/ Units	90 hours / Units 6
7. Course Instructor Name	Lecturer / Essa Ahmed Essa essa_hwj@ntu.edu.iq
8. Course objectives	

- Introduce students to the fundamentals, principles, and importance of automotive maintenance.
- Develop students' understanding of the construction, operation, and maintenance requirements of major automotive systems and components.
- The ability to maintain and repair parts and components of cars (diesel and gasoline).
- Enable students to perform routine inspection, preventive maintenance, and basic servicing of automotive systems using standard workshop procedures.
- Familiarize students with the tools, equipment, and instruments used in automotive maintenance and ensure their safe and proper use.
- Develop students' ability to identify, diagnose, and troubleshoot common mechanical faults in automotive systems.
- Promote safe working practices, professional ethics, and environmental awareness in automotive maintenance workshops.
- Enhance students' practical skills through hands-on maintenance activities and workshop training.
- Prepare students for advanced automotive maintenance courses and future employment in the automotive service industry.

9. **Course outcomes and teaching, learning and evaluation methods**

A. Knowledge and Understanding

Upon successful completion of this course, students will be able to:

A1. Explain the operating principles and working mechanism of the clutch system.

A2. Describe the construction and operation of the vehicle powertrain system.

A3. Explain the construction, functions, and working principles of the front axle and rear axle.

A4. Understand the operating principles and components of the automotive air conditioning system.

A5. Explain the operating principles and working cycle of the internal combustion engine.

A6. Understand the operating principles and functions of the transmission (gearbox).

B. Subject-Specific Skills

Upon successful completion of this course, students will be able to:

B1. Perform inspection, maintenance, and repair of the clutch system.

B2. Perform maintenance and repair of the vehicle powertrain system.

B3. Carry out maintenance and repair of the front axle and rear axle assemblies.

B4. Perform inspection, maintenance, and repair of the automotive air conditioning system.

Teaching and Learning Methods

- Interactive lectures.
- Practical workshop sessions.
- Laboratory demonstrations.
- Hands-on maintenance and repair exercises.
- Group discussions and problem-solving activities.
- Multimedia presentations and educational videos.
- Field visits to automotive maintenance workshops (where applicable).

Assessment Methods

- Daily quizzes.
- Practical tests.
- Laboratory and workshop performance assessment.
- Homework assignments and technical reports.
- Midterm examination.
- Final written and practical examinations.

10-Course structure

the week	hours	Required learning outcomes	Name of the unit/topic	Teaching method	Evaluation method
1	6	An overview of the history of cars and the main car parts The number and tools used in maintenance	- General idea about cars	Lecture + The workshop	Daily exams
2	6	Gasoline engines (two-stroke and four-stroke).	Gasoline engines	Lecture + The workshop	Daily exams
3	6	A general explanation of how a modern car engine works and how it produces power	engines work	Lecture + The workshop	Daily exams
4	6	Diesel engine, how it works, its types, and how to produce energy from it	Diesel engine	Lecture + The workshop	Daily exams
5	6	Explanation of two-stroke diesel engines, the basic differences between gasoline and diesel engines	Diesel and gasoline engines	Lecture + The workshop	Daily exams
6	6	An explanation of rotary and turbine engines and their comparison with conventional engines	-Rotary and turbine engines	Lecture + The workshop	Daily exams

7	6	Basic engine components: The fixed parts of the engine and the function of each part	-Basic engine parts	Lecture + The workshop	Daily exams
8	6	Basic engine components: moving parts and the function of each part	Moving engine components	Lecture + The workshop	Daily exams
9	6	Pistons and their types, piston rings and their function, connecting rods and connection methods, valves and their types, the most important malfunctions and how to maintain them.	Moving engine parts	Lecture + The workshop	Daily exams
10	6	Air intake system, exhaust system and its parts, mechanical fuel injection system (carburetor), general idea	- Fuel system in engines	Lecture + The workshop	Daily exams
11	6	A general idea about the electronic fuel injection system, identifying the main parts of the system	-Fuel injection systems	Lecture + The workshop	Daily exams
12	6	Types of electronic injection systems used in modern cars (TBI, MONO)	- Multiple fuel injection systems	Lecture + The workshop	Daily exams
13	6	The VVT system and how it works	- The VVT system and how it works	Lecture + The workshop	Daily exams
14	6	Parts of modern injection systems and the function of each part	- Parts of modern injection systems and the function of each part	Lecture + The workshop	Daily exams
15	6	Comparison between the old car engine and the modern car engine (additions made to the engine)	- Comparison between the old car engine and the modern car engine	Lecture + The workshop	Daily exams

11 . Course development plan

- Continuously update the course content to align with recent developments in automotive maintenance technologies, modern vehicle systems, and manufacturers' maintenance standards.
- Integrate modern teaching strategies by incorporating interactive learning, workshop-based instruction, problem-based learning, and case studies related to automotive maintenance.
- Enhance practical training through hands-on maintenance, diagnosis, and repair activities using modern automotive tools, equipment, and diagnostic devices.
- Strengthen the use of digital technologies by utilizing simulation software, multimedia resources, e-learning platforms, and electronic service manuals.
- Diversify assessment methods to include written examinations, practical tests, maintenance projects, technical reports, presentations, and continuous performance evaluation.
- Encourage independent learning by promoting the use of technical manuals, manufacturers' service information, online databases, and professional automotive resources.
- Organize field visits and industrial training in automotive service centers and maintenance workshops to expose students to current industry practices.
- Conduct periodic reviews of the course based on feedback from students, faculty members, and industry stakeholders to ensure alignment with program learning outcomes and labor market requirements.

12. Course Evaluation

No	Evaluation methods	Calendar appointment week	degree	Relative % weight
1	Midterm Exam 1(theoretical)	The seventh week	10	10
2	Midterm Exam 1(practical)	The seventh week	10	10
3	Midterm Exam 2(theoretical)	The twelfth week	10	10
4	Midterm Exam 2(practical)	The twelfth week	10	10
5	Coursework Marks	Coursework Marks	10	10
6	Final Coursework Mark	The final week (End of the course)	50	50
7	Final practical exam	Final semester exams	10	10
8	Final theoretical exam	Final semester exams	40	40
The Total		100	100%	100%

13.Infrastructure	
Classrooms, laboratories, and workshops	Available
Required prescribed textbooks	**Automotive Maintenance** – *Asst. Prof. Waleed Al-Jarrah*.
Main References	• **Automotive Maintenance** – *Asst. Prof. Waleed Al-Jarrah*. • **Automotive Technology: A Systems Approach** – Jack Erjavec & Rob Thompson. • **Automotive Mechanics** – William H. Crouse & Donald L. Anglin.
Recommended books and references (scientific journals, reports	Scientific journals in automotive engineering and vehicle maintenance. Technical reports and manufacturers' service manuals. SAE (Society of Automotive Engineers) technical publications. Automotive maintenance standards and technical documentation.
Electronic references, Internet sites	SAE International (www.sae.org) Bosch Automotive Aftermarket Technical Information (www.boschaftermarket.com) AutoZone Repair Guides (www.autozone.com) Haynes Manuals (www.haynes.com) Manufacturer service information websites and electronic workshop manuals.

Course Description: **Automotive Electrical and electronics1**

1- Course name	Automotive Electrical and electronics1
2- code	PMTA122
3- Available attendance forms	My presence
4- Semester/year	**First year / first semester**
5- Date this description was prepared	5/5/2026
6- Number of study hours/ Units	45 hours / Units 3
7- Course Instructor Name	Lecturer / Majid Ahmed Mohammed Majidahm _hwj@ntu.edu.iq

8-Course objectives

- Develop students' comprehensive understanding of the principles, construction, and operating mechanisms of automotive electrical and electronic systems.
- Enable students to correctly use modern electrical and electronic testing, inspection, and diagnostic equipment to identify faults in automotive electrical and electronic systems.
- Equip students with the knowledge and practical skills required to perform routine inspection, preventive maintenance, and servicing of automotive electrical and electronic systems.
- Familiarize students with the symbols, terminology, wiring diagrams, and electrical and electronic components used in automotive systems.
- Develop students' ability to inspect, test, and evaluate the serviceability and operational condition of automotive electrical and electronic components.

9- Course outcomes and teaching, learning and evaluation methods

A. Knowledge and Understanding

Upon successful completion of this course, students will be able to:

A1. Explain the fundamental principles of automotive electrical and electronic systems.

A2. Identify and describe the components and functions of automotive electrical systems.

A3. Interpret and analyze automotive electrical circuits and wiring diagrams.

A4. Apply systematic diagnostic procedures to identify electrical and electronic faults in automotive systems.

B. Course-Specific Skills

Upon successful completion of this course, students will be able to:

B1. Perform inspection, testing, and diagnosis of automotive electrical and electronic components and systems.

B2. Carry out routine maintenance and repair of automotive electrical network systems using standard technical procedures.

B3. Operate modern electrical and electronic diagnostic equipment effectively to detect, analyze, and troubleshoot faults in automotive electrical systems.

Teaching and Learning Methods

- Interactive lectures.
- Classroom discussions.
- Educational videos and multimedia presentations.
- Practical laboratory exercises.
- Workshop training.
- Assignments and technical reports.
- Supervised practical and summer training.

Assessment Methods

- Oral examinations.
- Practical laboratory tests.
- Written examinations.
- Midterm examinations.
- Final examinations.
- Continuous classroom assessment and daily quizzes.

C. Affective and Value-Based Objectives
Upon successful completion of this course, students will be able to:

C1. Demonstrate commitment to acquiring both theoretical knowledge and practical skills in automotive electrical and electronic systems.

C2. Evaluate and compare electrical and electronic components based on their performance, efficiency, and response characteristics.

C3. Apply analytical and critical-thinking skills to solve electrical and electronic problems encountered in automotive systems.

Teaching and Learning Methods

- Theoretical lectures.
- Classroom discussions and guided dialogue.
- Practical assignments.
- Laboratory activities.
- Problem-solving exercises.

Assessment Methods

- Laboratory performance evaluation.
- Written examinations.
- Daily quizzes.
- Oral questioning.
- Assessment of students' understanding through classroom participation and practical activities.

D. General and Transferable Skills (Employability and Personal Development)
Upon successful completion of this course, students will be able to:

D1. Design and implement basic automotive electrical and electronic circuits.

D2. Inspect, test, and evaluate automotive electrical and electronic components to determine their operational condition and serviceability.

D3. Develop technical documentation, teamwork, communication, and problem-solving skills required in the automotive maintenance industry.

D4. Utilize modern diagnostic technologies and technical resources to support lifelong learning and professional development in automotive electrical and electronic engineering.

10-Course structure					
the week	hours	Required learning outcomes	Name of the unit/topic	Teaching method	Evaluation method
1	4	Introducing the student to the types of electrical power, the main electrical sources of the car, the type of electricity used in the car, as well as the magnetic theory	- Introduction to the general principles of automobile electrical	Lecture + film screening + laboratory	Daily exams
2	4	Learn about Krishof's laws and types of electrical circuits (connecting resistors), series, and parallel.	-Methods of connecting electrical circuits	Lecture + film screening + laboratory	Daily exams
5-4-3	12	Learn how to use the solutions used for batteries, definitions of alternating current, and infer which part of the car works.	- How to check batteries	Lecture + film screening + laboratory	Daily exams
6	4	-Learn about the general properties of magnetism and the relationship between electrical energy, magnetic energy, and electromagnetic induction	- General properties of magnets	Lecture + film screening + laboratory	Daily exams
7	4	- Identifying the charging circuit in the car, a general idea about the direct current (DC) generator, its parts and components, its working principle, the general diagram of the generator’s electrical circuit.	- Charging circuits for a DC generator	Lecture + film screening + laboratory	Daily exams
8	4	- The charging circuit for the alternating current (AC) generator, its parts,	- Charging circuits for an alternating	Lecture + film screening +	Daily exams

		components, working principle, general diagram of the generator’s electrical circuit.	current generator	laboratory	
9	4	- Identifying the starter motor (the predecessor), its parts, components, principle of operation, and the general diagram of the electrical circuit.	- The engine (predecessor) how it works	Lecture + film screening + laboratory	Daily exams
11-10	8	- Identifying the connection of energy sources (batteries) and the ignition system	- Battery connection sources	Lecture + film screening + laboratory	Daily exams
12	4	- Identify the main, side and interior lighting system	- Lighting system	Lecture + film screening + laboratory	Daily exams
13	4	- Auxiliary devices in the car (fuel gauge, oil pressure gauge, charging current gauge, temperature gauge)	- Auxiliary devices in the car	Lecture + film screening + laboratory	Daily exams
14	4	- The electrical circuit to control the car doors and windows (opening and closing).	- Electrical circuits in cars	Lecture + film screening + laboratory	Daily exams
15	4	Windshield wiper device and electrical audio circuit	- Electrical circuits	Lecture + film screening + laboratory	Daily exams

11 . Course development plan

- Continuously update the course content to keep pace with recent developments in automotive electrical and electronic systems, including smart vehicle technologies, electronic control systems, and manufacturers' service standards.
- Integrate modern teaching and learning strategies by incorporating interactive learning, problem-based learning, simulation-based training, blended learning, and practical workshop activities.
- Enhance practical training through the use of advanced diagnostic equipment, oscilloscopes, scan tools, electronic testing devices, and automotive electrical and electronic training boards.
- Expand laboratory facilities by introducing modern training panels and simulation systems that replicate real automotive electrical and electronic systems for fault diagnosis and troubleshooting.
- Diversify assessment methods to include written examinations, practical laboratory tests, diagnostic projects, technical reports, presentations, oral examinations, and continuous classroom assessment.
- Promote independent learning by encouraging students to use manufacturers' service manuals, technical databases, electronic learning platforms, and professional automotive diagnostic resources.
- Strengthen industry collaboration through field visits, summer training, and partnerships with automotive service centers and authorized dealerships to expose students to current

automotive technologies.

- Conduct periodic reviews of the course based on feedback from students, faculty members, and industry representatives to ensure continuous improvement and alignment with program learning outcomes and labor market requirements.

12. Course Evaluation

No	Evaluation methods	Calendar appointment week	degree	Relative % weight
1	Midterm Exam 1(theoretical)	The seventh week	10	10
2	Midterm Exam 1(practical)	The seventh week	10	10
3	Midterm Exam 2(theoretical)	The twelfth week	10	10
4	Midterm Exam 2(practical)	The twelfth week	10	10
5	Coursework Marks	Coursework Marks	10	10
6	Final Coursework Mark	The final week (End of the course)	50	50
7	Final practical exam	Final semester exams	10	10
8	Final theoretical exam	Final semester exams	40	40
The Total		100	100%	100%

13.Infrastructure

Classrooms, laboratories, and workshops	Available
Required prescribed textbooks	Automotive Electrical Systems Automotive Electronics Automotive Electricity and Electronics
Main References	1- AUTOELECTRICAL& ELECTRONIC SYSTEM. 2-MODERN AUTOMOTIVE ELECTRICITY
Recommended books and references scientific journals, reports)	ADVAANCED AUTOMOTIVE TECHNOLO
Electronic references, Internet sites	WWW.EDEC.WORKSHAP

Course Description: **thermodynamics**

1. Course name	thermodynamics
2. code	PMTA124
3. Available attendance forms	My presence
4. Semester/year	First year / first semester
5. Date this description was prepared	5/5/2026
6. Number of study hours/ Units	60 hours / Units 4
7. Course Instructor Name	Assistant Lecturer / Yaareb Elias Ahmed yaarub_hwj@ntu.edu.iq

8-Course objectives

- Develop students' understanding of the fundamental principles and laws of thermodynamics and their engineering applications.
- Equip students with the knowledge and analytical skills required to solve thermodynamic problems and perform calculations related to energy, heat transfer, work, and thermodynamic processes.
- Enhance students' ability to apply thermodynamic concepts to engineering and scientific problems within their field of specialization.
- Strengthen students' logical, analytical, and critical thinking skills in solving thermodynamic and engineering problems.
- Enable students to interpret thermodynamic data, correlate theoretical concepts with practical applications, and make sound engineering decisions.
- Develop students' competence in using thermodynamic principles to analyze the performance and efficiency of engineering systems.
- Prepare students for advanced engineering courses by providing a solid foundation in thermodynamics and energy analysis.

9- Course outcomes and teaching, learning and evaluation methods

A. Knowledge and Understanding

Upon successful completion of this course, students will be able to:

A1. Explain the fundamental concepts, laws, and principles of thermodynamics and their engineering applications.

A2. Analyze thermodynamic systems and perform calculations involving thermodynamic properties, energy, heat transfer, work, and state variables.

A3. Interpret and analyze thermodynamic processes and cycles using **P–V** and **T–S** diagrams, and evaluate the heat transfer, work output, and thermal efficiency of engineering cycles.

A4. Demonstrate a comprehensive understanding of the **First Law** and **Second Law of Thermodynamics**, ideal gas behavior, and air-standard cycles.

B. Course-Specific Skills

Upon successful completion of this course, students will be able to:

B1. Solve thermodynamic and engineering problems using appropriate mathematical and analytical techniques.

B2. Apply scientific methods to analyze thermodynamic systems and evaluate engineering processes.

B3. Calculate thermodynamic properties and performance parameters of engineering systems with accuracy.

B4. Use engineering equations, tables, charts, and software tools to solve thermodynamic problems efficiently.

Teaching and Learning Methods

- Interactive lectures.
- Classroom discussions.
- Educational videos and multimedia presentations.
- Problem-solving sessions and tutorial classes.
- Practical exercises and numerical assignments.
- Individual and group projects.

Assessment Methods

- Oral examinations.
- Written quizzes.
- Homework assignments.
- Midterm examinations.
- Final written examination.
- Continuous classroom assessment.

C. Affective and Value-Based Objectives

Upon successful completion of this course, students will be able to:

C1. Demonstrate commitment to acquiring theoretical knowledge and practical analytical skills in thermodynamics.

C2. Work effectively as a member of a team in solving engineering problems.

C3. Apply logical and critical thinking to analyze engineering problems and develop appropriate technical solutions.

C4. Appreciate the importance of thermodynamics in engineering practice and lifelong professional development.

Teaching and Learning Methods

- Theoretical lectures.
- Classroom discussions and guided dialogue.
- Individual and group assignments.
- Problem-based learning.
- Classroom activities and presentations.

Assessment Methods

- Written examinations.
- Daily quizzes.
- Homework and assignments.
- Classroom participation.
- Oral questioning.
- Evaluation of students' analytical and problem-solving abilities.

D. General and Transferable Skills (Employability and Personal Development)

Upon successful completion of this course, students will be able to:

D1. Apply mathematical and engineering principles to solve a wide range of thermodynamic problems.

D2. Prepare clear and well-organized technical reports related to thermodynamic analysis and engineering applications.

D3. Utilize engineering software and computational tools to analyze and solve complex thermodynamic problems.

D4. Develop communication, teamwork, independent learning, and lifelong learning skills essential for engineering practice.

10- Course structure

the week	hours	Required learning outcomes	Name of the unit/topic	Teaching method	Evaluation method
1	4	Introducing the student to the first law of thermodynamics, types of energy (dynamic energy, potential mechanical energy, internal energy, ,(heat, work	The first law of ,thermodynamics	Lecture + film screening + laboratory	Daily exams
2	4	Identify the pressure-volume diagram system	Pressure-volume diagram	Lecture + film screening + laboratory	Daily exams
3	4	Identify the energy of flow, the enthalpy energy conservation equation of the first law of thermodynamics, ,classifications of systems	The first law of thermodynamics	Lecture + film screening + laboratory	Daily exams

4	4	Learn about applications of the first law of thermodynamics to closed systems, the energy equation for steady flow	Applications of the first law of thermodynamics -	Lecture + film screening + laboratory	Daily exams
5	4	Identify the application of the first law to steady-state ,open systems -	Application of the first law of open systems	Lecture + film screening + laboratory	Daily exams
6	4	Work representation of open systems of steady flow on a volume - pressure diagram -	Open systems	Lecture + film screening + laboratory	Daily exams
7	4	Learn about the second law of thermodynamics: reversible process, entropy, temperature and entropy diagram, place coordinates on theTS diagram cycles , -	Second law of thermodynamics	Lecture + film screening + laboratory	Daily exams
8	4	Identify shear stress, fluid flow dynamics, Newton's law of viscosity -	Fluid flow	Lecture + film screening + laboratory	Daily exams
9	4	Identify the operation of the cycle, the thermal efficiency of the cycle, examples. Case of the second law of heat engine and heat pump -	Courses	Lecture + film screening + laboratory	Daily exams
10	4	Ideal gas: specific heat at constant volume, specific heat at constant pressure, equation of state for an ideal gas, gas constant, general gas constant -	Ideal gases	Lecture + film screening + laboratory	Daily exams
11	4	Constant volume process, constant pressure process, constant temperature process, study of the	procedures-	Lecture + film screening + laboratory	Daily exams

		process onPV diagram and TS diagram			
12	4	-Adiabatic process , isotropic process, study of the process on thePV diagram and the TS diagram	Adiabatic process	Lecture + film screening + laboratory	Daily exams
13	4	Thermodynamic cycles - (Otto cycle - representation of the Otto cycle onPV andT – S diagrams thermal efficiency (evaluation	Thermodynamic cycles (auto)	Lecture + film screening + laboratory	Daily exams
14	4	Thermodynamic cycles diesel cycle –) representation of the diesel cycle onPV andT – S diagrams evaluation of – thermal efficiency examples on the diesel (cycle	Thermodynamic cycles (diesel)	Lecture + film screening + laboratory	Daily exams
15	4	Combined cycle studying , the cycle on thePV diagram and theTS diagram finding the , variable heat, work efficiency factors affecting the efficiency of the standard air cycle, comparison between (cars, diesel, dual cycles)	Combined cycle	Lecture + film screening + laboratory	Daily exams

11 . Course development plan

- **Continuously update the course content** to reflect recent advances in thermodynamics, energy systems, renewable energy technologies, and modern engineering applications.
- **Integrate modern teaching strategies** by incorporating interactive learning, problem-based learning, simulation-based instruction, blended learning, and engineering case studies.
- **Enhance practical learning** through laboratory experiments, computer simulations, and engineering software for thermodynamic analysis and system performance evaluation.
- **Strengthen the use of digital technologies** by utilizing e-learning platforms, virtual laboratories, multimedia resources, and computational tools to support teaching and learning.
- **Diversify assessment methods** by including quizzes, homework assignments, laboratory reports, technical projects, presentations, written examinations, and continuous classroom assessment.
- **Promote independent learning** by encouraging students to use scientific journals, engineering databases, digital libraries, and online technical resources to expand their knowledge.
    - **Develop students' analytical and problem-solving skills** through engineering design problems, numerical analysis, and real-world thermodynamic applications.
    - **Conduct periodic reviews of the course** based on feedback from students, faculty members, and industry stakeholders to ensure continuous improvement and alignment with program learning outcomes and labor market requirements.

12. Course Evaluation

No	Evaluation methods	Calendar appointment week	degree	Relative % weight
1	Midterm Exam 1(theoretical)	The seventh week	10	10
2	Midterm Exam 1(practical)	The seventh week	10	10
3	Midterm Exam 2(theoretical)	The twelfth week	10	10
4	Midterm Exam 2(practical)	The twelfth week	10	10

5	Coursework Marks	Coursework Marks	10	10
6	Final Coursework Mark	The final week (End of the course)	50	50
7	Final practical exam	Final semester exams	10	10
8	Final theoretical exam	Final semester exams	40	40
The Total		100	100%	100%

13.Infrastructure	
Classrooms, laboratories, and workshops	Available
Required prescribed textbooks	• Thermodynamics books • Fundamentals of Engineering Thermodynamics – Michael J. Moran, Howard N. Shapiro, Daisie D. Boettner & Margaret B. Bailey. • Thermodynamics: An Engineering Approach – Yunus A. Çengel & Michael A. Boles.
Main References	• Engineering Thermodynamics – P. K. Nag. • Introduction to Thermodynamics and Heat Transfer – Yunus A. Çengel. • Fundamentals of Thermodynamics – Richard E. Sonntag, Claus Borgnakke & Gordon J. Van Wylen.
Recommended books and references scientific journals, reports)	• Peer-reviewed scientific journals in thermodynamics, energy engineering, and heat transfer. • Technical reports and publications issued by engineering societies (e.g., ASME). • Research papers related to thermodynamics, energy systems, and thermal engineering.
Electronic references, Internet sites	• ASME (American Society of Mechanical Engineers): https://www.asme.org • MIT OpenCourseWare – Thermodynamics: https://ocw.mit.edu • NIST Chemistry WebBook: https://webbook.nist.gov • Engineering Toolbox: https://www.engineeringtoolbox.com • ScienceDirect: https://www.sciencedirect.com • SpringerLink: https://link.springer.com

Course Description: **Engineering Mechanics**

1. Course name	Engineering Mechanics
2. code	PMTA126
3. Available attendance forms	My presence
4. Semester/year	First year / first semester
5. Date this description was prepared	5/5/2026
6. Number of study hours/ Units	45 hours / Units 3
7. Course Instructor Name	Yaareb Elias Ahmed yaarub_hwj@ntu.edu.iq

8-Course objectives

- Develop students' understanding of the fundamental principles and concepts of engineering mechanics and their applications in engineering analysis and design.
- Equip students with the knowledge and analytical skills required to analyze forces, moments, and equilibrium conditions in engineering systems.
- Enable students to apply engineering mechanics principles to solve problems involving forces and their effects in two-dimensional and three-dimensional systems.
- Develop students' ability to construct and interpret free-body diagrams and apply equilibrium equations to engineering problems.
- Strengthen students' mathematical, analytical, and logical thinking skills in solving engineering mechanics problems.
- Enhance students' ability to relate theoretical concepts to practical engineering applications involving structures and mechanical systems.
- Prepare students for advanced engineering courses by providing a solid foundation in statics and engineering mechanics.

9- Course outcomes and teaching, learning and evaluation methods

A. Knowledge and Understanding

Upon successful completion of this course, students will be able to:

A1. Analyze forces, moments, and their effects on engineering systems using the principles of engineering mechanics.

A2. Explain the relationships among the fundamental concepts of engineering mechanics and apply them to engineering analysis.

A3. Apply the principles of equilibrium to solve engineering mechanics problems in two-dimensional and three-dimensional systems.

A4. Interpret free-body diagrams and analyze the behavior of engineering structures and mechanical components.

A5. Apply engineering mechanics principles in the simplified design and evaluation of mechanical components.

B. Course-Specific Skills

Upon successful completion of this course, students will be able to:

B1. Solve engineering mechanics problems using appropriate analytical and mathematical methods.

B2. Construct and analyze free-body diagrams for engineering systems.

B3. Apply equilibrium equations to determine unknown forces, reactions, and moments.

B4. Develop systematic problem-solving skills through engineering examples, exercises, and practical applications.

Teaching and Learning Methods

- Interactive lectures.
- Classroom discussions.
- Educational videos and multimedia presentations.
- Problem-solving sessions.
- Tutorial exercises and assignments.
- Individual and group learning activities.

Assessment Methods

- Oral examinations.
- Written quizzes.
- Homework assignments.
- Midterm examinations.
- Final written examination.
- Continuous classroom assessment.

C. Affective and Value-Based Objectives

Upon successful completion of this course, students will be able to:

C1. Demonstrate commitment to acquiring theoretical knowledge and analytical skills in engineering mechanics.

C2. Develop confidence in analyzing engineering problems logically and systematically.

C3. Apply critical thinking and sound engineering judgment to develop appropriate engineering solutions.

C4. Appreciate the importance of engineering mechanics as a fundamental subject for engineering analysis and design.

Teaching and Learning Methods

- Theoretical lectures.
- Classroom discussions and guided dialogue.
- Assignments and problem-solving activities.
- Classroom presentations and collaborative learning.

Assessment Methods

- Written examinations.
- Daily quizzes.
- Homework assignments.
- Oral questioning.
- Continuous assessment of classroom participation and problem-solving performance.

D. General and Transferable Skills (Employability and Personal Development)

Upon successful completion of this course, students will be able to:

D1. Apply analytical and mathematical techniques to solve engineering mechanics problems.

D2. Develop effective engineering problem-solving and decision-making skills.

D3. Prepare technical reports and communicate engineering solutions clearly and professionally.

D4. Work independently and collaboratively while applying engineering principles to practical situations.

10. Course structure					
the week	hours	Required learning outcomes	Name of the unit/topic	Teaching method	Evaluation method
1	3	- Introduction & topics of mechanics ,Definition of mechanics science		Lecture + laboratory	Daily exams
2	3	- Force, resolution and resultant ,vectors		Lecture + laboratory	Daily exams
3	3	- Moment of the force , Couples		Lecture + laboratory	Daily exams
4	3	- Equilibrium, definition		Lecture + laboratory	Daily exams
5	3	- Free body diagram		Lecture + laboratory	Daily exams
6	3	- Friction, theory and applications types of friction		Lecture + laboratory	Daily exams
7	3	- Center of gravity		Lecture + laboratory	Daily exams
8	3	- Moment of interior, definition, single area		Lecture + laboratory	Daily exams
9	3	- Moment of internal, application ,parallel axis theory		Lecture + laboratory	Daily exams
10	3	- Dynamics science definition the Newton's second law and application		Lecture + laboratory	Daily exams

11	3	- Rectilinear motion definition and applications		Lecture + laboratory	Daily exams
12	3	- Rotational motion about the fixed axes		Lecture + laboratory	Daily exams
13	3	- Drawing the curve of the stress force		Lecture + laboratory	Daily exams
14	3	- Sheering force, definition and application		Lecture + laboratory	Daily exams
15	3	- Bernoulli's formula, applications		Lecture + laboratory	Daily exams

11 . Course development plan

- Continuously update the course content to reflect recent developments in engineering mechanics, computational analysis, and modern engineering applications.
- Integrate modern teaching strategies by incorporating interactive learning, problem-based learning, engineering simulations, blended learning, and case studies.
- Enhance practical learning through laboratory demonstrations, engineering models, computer-aided analysis, and real-world engineering applications.
- Strengthen the use of digital technologies by utilizing engineering software, simulation tools, e-learning platforms, and multimedia resources to support teaching and learning.
- Diversify assessment methods to include quizzes, homework assignments, engineering projects, technical reports, presentations, written examinations, and continuous classroom assessment.
- Promote independent learning by encouraging students to use scientific journals, engineering databases, technical references, and online educational resources.

- Develop students' analytical, mathematical, and problem-solving skills through engineering design problems, numerical analysis, and practical case studies.
- Conduct periodic reviews of the course based on feedback from students, faculty members, and industry stakeholders to ensure continuous improvement and alignment with program learning outcomes and labor market requirements.

12. Course Evaluation

No	Evaluation methods	Calendar appointment week	degree	Relative % weight
1	Midterm Exam 1(theoretical)	The seventh week	30	30
2	Midterm Exam 2(theoretical)	The twelfth week	30	30
3	Coursework Marks	Coursework Marks	10	10
4	Final Coursework Mark	The final week (End of the course)	40	40
5	Final theoretical exam	Final semester exams	60	60
The Total		100	100%	100%

13.Infrastructure

Classrooms, laboratories, and workshops	Available
Required prescribed textbooks	• Engineering Mechanics Laboratory. • Engineering workshops equipped with the necessary instructional models and experimental apparatus. • Static & dynamics Bedford and fowler 4th ed 2005 • Engineer in Machine 3rd ed 1968 Singh, Higdon • Sadhu Strength of Martial 4th ed 2007 9th Stiles
Main References	• Engineering Mechanics: Statics – J. L. Meriam & L. G. Kraige.

	• Engineering Mechanics: Dynamics – J. L. Meriam & L. G. Kraige. • Vector Mechanics for Engineers: Statics and Dynamics – Ferdinand P. Beer, E. Russell Johnston Jr., David F. Mazurek & Phillip J. Cornwell.
Recommended books and references scientific journals, reports)	• Scientific journals in engineering mechanics and mechanical engineering. • Research papers and technical reports related to statics, dynamics, and strength of materials. • ASME technical publications and engineering standards.
Electronic references, Internet sites	• ASME (American Society of Mechanical Engineers): https://www.asme.org • MIT OpenCourseWare – Engineering Mechanics: https://ocw.mit.edu • NPTEL Engineering Mechanics: https://nptel.ac.in • Engineering Toolbox: https://www.engineeringtoolbox.com • ScienceDirect: https://www.sciencedirect.com • SpringerLink: https://link.springer.com

Course Description: **Automotive Engines Maintenance2**

1. Course name	Automotive Engines Maintenance2
2. code	PMTA121
3. Available attendance forms	My presence
4. Semester/year	First year /second semester
5. Date this description was prepared	5/5/2026
6. Number of study hours/ Units	90 hours / Units 6
7. Course Instructor Name	Lecturer / Essa Ahmed Essa essa_hwj@ntu.edu.iq

8-Course objectives

- Develop students' understanding of the principles, construction, operation, and maintenance of gasoline and diesel automotive engines.
- Enable students to inspect, diagnose, and identify mechanical and electrical faults in automotive engines using standard diagnostic procedures and equipment.
- Equip students with the knowledge and practical skills required to maintain, service, and repair the components and systems of gasoline and diesel engines.
- Develop students' ability to perform routine inspection, preventive maintenance, and scheduled servicing of automotive engines in accordance with manufacturers' specifications.
- Familiarize students with modern engine maintenance techniques, diagnostic tools, and workshop safety procedures.
- Strengthen students' analytical and troubleshooting skills to efficiently identify engine malfunctions and implement appropriate repair solutions.
- Prepare students for advanced automotive maintenance courses and professional practice in automotive engine service and repair.

9- Course outcomes and teaching, learning and evaluation methods

A. Knowledge and Understanding

Upon successful completion of this course, students will be able to:

A1. Explain the construction, operating principles, and functions of the major components and systems of gasoline and diesel engines.

A2. Identify, analyze, and diagnose common mechanical, electrical, and electronic faults in automotive engines.

A3. Demonstrate comprehensive knowledge of engine maintenance procedures, repair techniques, and servicing requirements for gasoline and diesel engines.

A4. Understand manufacturers' maintenance specifications, service procedures, and safety requirements for automotive engine maintenance.

B. Course-Specific Skills

Upon successful completion of this course, students will be able to:

B1. Perform inspection, maintenance, servicing, and repair of gasoline and diesel engines using standard workshop procedures.

B2. Apply mechanical, electrical, and electronic diagnostic techniques to identify engine faults accurately.

B3. Operate modern diagnostic equipment and specialized workshop tools to inspect, maintain, and repair automotive engines.

B4. Carry out preventive maintenance and scheduled servicing in accordance with manufacturers' recommendations.

Teaching and Learning Methods

- Interactive theoretical lectures.
- Practical laboratory and workshop sessions.
- Classroom discussions and case studies.
- Technical reports and assignments.
- Demonstrations using modern diagnostic equipment.
- Industrial training and supervised summer training.
- Multimedia presentations and instructional videos.

Assessment Methods

- Daily quizzes.
- Written examinations.
- Practical laboratory and workshop tests.
- Oral examinations.
- Technical reports and assignments.
- Midterm examinations.
- Final written and practical examinations.
- Continuous classroom assessment.

C. Affective and Value-Based Objectives

Upon successful completion of this course, students will be able to:

C1. Demonstrate commitment to acquiring both theoretical knowledge and practical skills in automotive engine maintenance.

C2. Appreciate the importance of modern diagnostic technologies in improving maintenance quality and repair efficiency.

C3. Develop confidence in analyzing mechanical, electrical, and electronic engine faults and selecting appropriate repair procedures.

C4. Demonstrate professionalism, teamwork, safety awareness, and ethical responsibility in automotive maintenance workshops.

Teaching and Learning Methods

- Theoretical lectures.
- Guided discussions and classroom dialogue.
- Practical assignments.
- Laboratory and workshop activities.
- Problem-solving exercises.

Assessment Methods

- Laboratory performance evaluation.
- Written examinations.
- Daily quizzes.
- Oral questioning.
- Continuous assessment of students' participation, technical competence, and practical performance.

D. General and Transferable Skills (Employability and Personal Development)

Upon successful completion of this course, students will be able to:

D1. Apply mechanical and engineering principles effectively in automotive engine maintenance and repair.

D2. Utilize engineering software, technical manuals, and digital resources to support engine diagnosis and maintenance.

D3. Prepare technical reports and maintenance documentation using appropriate engineering standards.

D4. Develop analytical thinking, teamwork, communication, and problem-solving skills required for employment in the automotive service industry.

D5. Apply mathematical and engineering calculations to support maintenance, troubleshooting, and repair decisions.

10- Course structure

the week	hours	Required learning outcomes	Name of the unit/topic	Teaching method	Evaluation method
1	6	Engine auxiliary systems , a system that cools the engine with water	Systems	+ The lecture The workshop	Daily exams
2	6	Thermostat used in the engine cooling system	Thermostat	+ The lecture The workshop	Daily exams
3	6	water cooling system , Engine air cooling system	Cooling - system	+ The lecture The workshop	Daily exams
4	6	lubrication organization , parts of the system and the function of each part	Lubrication organization	+ The lecture The workshop	Daily exams
5	6	The most important malfunctions of the lubrication system, methods	Lubrication system malfunctions	+ The lecture The workshop	Daily exams

		of detecting and maintaining them			
6	6	The normal ignition system (battery), the parts of the system and how they work	Regular ignition system	+ The lecture The workshop	Daily exams
7	6	Electronic ignition system, its types, components and how it works	Electronic ignition system	+ The lecture The workshop	Daily exams
8	6	Methods for detecting the causes of low engine efficiency	Engine malfunctions	+ The lecture The workshop	Daily exams
9	6	Methods of diagnosing and repairing engine faults	Diagnosing engine faults	+ The lecture The workshop	Daily exams
10	6	The process of removing carbon and deposits from the combustion chamber and valve seats (crane (process	Removing carbon from the combustion chambers	+ The lecture The workshop	Daily exams
11	6	The most important fixed and variable measurements used in turning cylinders, crankshafts and camshafts	Crankshaft and camshaft measurements	+ The lecture The workshop	Daily exams
12	6	Methods of removing and inserting cylinder liners into the cylinder block	Cylinder block	+ The lecture The workshop	Daily exams
13	6	Checking the pressure and temperature regulators for the electronic injection system	Electronic injection systems	+ The lecture The workshop	Daily exams
14	6	The most important causes of engine overheating are slapping , knocking , difficulty in ignition , high oil consumption , and high .fuel consumption	Engine malfunctions	+ The lecture The workshop	Daily exams
15	6	Identify the devices for checking and diagnosing engine faults	Devices for checking and diagnosing engine faults	+ The lecture The workshop	Daily exams

11 . Course development plan

- Continuously update the course content to reflect recent developments in gasoline and diesel engine technologies, manufacturers' service procedures, and modern maintenance standards.
- Integrate modern teaching strategies by incorporating interactive learning, problem-based learning, workshop-based instruction, simulation techniques, and case studies related to automotive engine maintenance.
- Enhance practical training through hands-on inspection, diagnosis, maintenance, overhaul, and repair of gasoline and diesel engines using modern workshop equipment and diagnostic tools.
- Expand laboratory and workshop facilities by introducing advanced engine training units, computerized diagnostic systems, engine analyzers, and simulation equipment that replicate real automotive engine systems.
- Diversify assessment methods to include written examinations, practical laboratory tests, maintenance projects, technical reports, oral presentations, and continuous performance assessment.
- Encourage independent learning by promoting the use of manufacturers' service manuals, technical databases, digital libraries, engineering software, and online automotive maintenance resources.
- Strengthen collaboration with industry through field visits, summer training, and partnerships with automotive maintenance centers and authorized service workshops to expose students to current industry practices.
- Conduct periodic reviews of the course based on feedback from students, faculty members, and industry representatives to ensure continuous improvement and alignment with program learning outcomes and labor market requirements.
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12. Course Evaluation

No	Evaluation methods	Calendar appointment week	degree	Relative % weight
1	Midterm Exam 1(theoretical)	The seventh week	10	10
2	Midterm Exam 1(practical)	The seventh week	10	10
3	Midterm Exam 2(theoretical)	The twelfth week	10	10
4	Midterm Exam 2(practical)	The twelfth week	10	10
5	Coursework Marks	Coursework Marks	10	10
6	Final Coursework Mark	The final week (End of the course)	50	50
7	Final practical exam	Final semester exams	10	10
8	Final theoretical exam	Final semester exams	40	40
The Total		100	100%	100%

13. Infrastructure

Classrooms, laboratories, and workshops	Available
Required prescribed textbooks	**Automotive Maintenance** – *Asst. Prof. Waleed Al-Jarrah*.
Main References	• **Automotive Maintenance** – *Asst. Prof. Waleed Al-Jarrah*. • **Automotive Technology: A Systems Approach** – Jack Erjavec & Rob Thompson. • **Automotive Mechanics** – William H. Crouse & Donald

	L. Anglin.
Recommended books and references (scientific journals, reports	Scientific journals in automotive engineering and vehicle maintenance. Technical reports and manufacturers' service manuals. SAE (Society of Automotive Engineers) technical publications. Automotive maintenance standards and technical documentation.
Electronic references, Internet sites	SAE International (www.sae.org) Bosch Automotive Aftermarket Technical Information (www.boschaftermarket.com) AutoZone Repair Guides (www.autozone.com) Haynes Manuals (www.haynes.com) Manufacturer service information websites and electronic workshop manuals.

Course Description: **Automotive electronic control systems 1**

1. Course name	Automotive electronic control systems 1
2. code	PMTA212
3. Available attendance forms	My presence
4. Semester/year	Second year /first semester
5. Date this description was prepared	5/5/2026
6. Number of study hours/ Units	60 hours / Units 4
7. Course Instructor Name	Lecturer / Jasim Ibrahim Musa jasim_hwj@ntu.edu.iq

8-Course objectives

- Develop students' understanding of the principles, functions, and applications of electronic control systems used in modern automobiles.
- Familiarize students with the various types of automotive diagnostic and testing equipment and their applications in vehicle inspection and fault diagnosis.
- Introduce students to the electronic systems incorporated in modern vehicles, including sensors, actuators, electronic control units (ECU), and communication networks.
- Enable students to understand the operating principles and control strategies of automotive electronic control systems.
- Develop students' ability to use modern automotive diagnostic equipment and electronic testing devices to inspect and evaluate vehicle electronic systems.
- Enhance students' knowledge of electronic control technologies used in engine management, safety, comfort, and vehicle performance systems.
- Prepare students for advanced courses in automotive electronics, diagnostics, and intelligent vehicle technologies through a strong theoretical and practical foundation.

9- Course outcomes and teaching, learning and evaluation methods

A.Knowledge and Understanding

Upon successful completion of this course, students will be able to:

A1. Explain the principles, functions, and operating mechanisms of automotive electronic control systems and diagnostic equipment.

A2. Identify the procedures, testing methods, and operational requirements for automotive electronic control and diagnostic systems.

A3. Explain the operating principles and proper use of automotive electronic diagnostic and testing equipment.

A4. Describe the functions of sensors, actuators, electronic control units (ECUs), and in-vehicle communication systems.

B. Course-Specific Skills

Upon successful completion of this course, students will be able to:

B1. Perform inspection and diagnostic procedures for automotive electronic control systems using appropriate diagnostic equipment.

B2. Test, evaluate, and replace faulty electronic components and control system elements according to standard maintenance procedures.

B3. Operate modern automotive diagnostic tools and electronic testing equipment safely and effectively.

Teaching and Learning Methods

- Interactive theoretical lectures.
- Practical laboratory sessions.
- Educational videos and multimedia presentations.
- Graduation projects and practical assignments.
- Demonstrations using modern automotive diagnostic equipment.

Assessment Methods

- Oral examinations.
- Written examinations.
- Practical laboratory tests.
- Laboratory reports.
- Midterm examinations.
- Final written and practical examinations.
- Continuous classroom assessment.

C. Affective and Value-Based Objectives

Upon successful completion of this course, students will be able to:

C1. Appreciate the importance of modern electronic control systems in the development and performance of contemporary vehicles.

C2. Recognize the significance of using advanced electronic technologies to improve maintenance efficiency, optimize time and resources, and enhance vehicle performance.

C3. Demonstrate professional responsibility, safety awareness, and commitment to continuous learning in automotive electronic technologies.

Teaching and Learning Methods

- Theoretical lectures.
- Laboratory training.
- Graduation projects.
- Field visits to automotive manufacturing plants and service centers.
- Guided discussions and practical activities.

Assessment Methods

- Continuous observation of practical performance.
- Oral interviews.
- Cumulative records of student performance.
- Written examinations.
- Daily quizzes.
- Oral questioning.

D. General and Transferable Skills (Employability and Personal Development)

Upon successful completion of this course, students will be able to:

D1. Select and use appropriate diagnostic equipment, tools, and materials required for inspecting and servicing automotive electronic control systems.

D2. Inspect, test, and evaluate automotive electronic components and systems to determine their operational condition and serviceability.

D3. Develop technical problem-solving, communication, teamwork, and documentation skills required for professional practice in the automotive industry.

D4. Utilize modern automotive diagnostic technologies and technical resources to support lifelong learning and continuous professional development.

10. Course structure

the week	hours	Required learning outcomes	Name of the unit/topic	Teaching method	Evaluation method
1	4	that Can requester Identify on Devices to examine Systems the cars Modern	Devices to examine the cars	Lecture + film screening + laboratory	Daily exams + semester + final exams
2	4	Identify the engine's electronic control unit in terms of components and functions	Electronic control unit	Lecture + film screening + laboratory	Daily exams + semester + final exams
3	4	Identify the electronic control units for various systems of modern cars	Electronic control unit	Lecture + film screening + laboratory	Daily exams + semester + final exams
4	4	Explanation of the motor input units (sensors)	Input unit	Lecture + film screening + laboratory	Daily exams + semester + final exams

5	4	Explanation of the air temperature sensor with the engine coolant sensor	Sensors	Lecture + film screening + laboratory	Daily exams + semester + final exams
6	4	Explaining the first and second oxygen sensors in terms of location, structure, function, and malfunctions	Sensors	Lecture + film screening + laboratory	Daily exams + semester + final exams
7	4	Explanation of the catalytic converter with slap sensor in terms of location, installation, function and malfunctions	Adapter	Lecture + film screening + laboratory	Daily exams + semester + final exams
8	4	Explanation of the absolute pressure sensor and the air flow sensor in terms of location, installation, function, and malfunctions	Sensors	Lecture + film screening + laboratory	Daily exams + semester + final exams
9	4	Explanation of the camshaft position sensor and the crankshaft position sensor	Sensors	Lecture + film screening + laboratory	Daily exams + semester + final exams
10	4	Explaining the vehicle speed sensor in terms of the types and functions it performs	Sensors	Lecture + film screening + laboratory	Daily exams + semester + final exams
11	4	Explanation of the free speed valve, its installation, types, function, and malfunctions	Speed valve	Lecture + film screening + laboratory	Daily exams + semester + final exams
12	4	Explaining the types of fuel injection valves in modern cars and how to	Fuel injection valves	Lecture + film screening + laboratory	Daily exams + semester + final exams

		operate them			
13	4	Explaining the lost electronic ignition system, how it works, its types and features	Electronic ignition system	Lecture + film screening + laboratory	Daily exams + semester + final exams
14	4	Explaining the single electronic ignition system, how it works, its types, advantages, disadvantages, and malfunctions	Electronic ignition system	Lecture + film screening + laboratory	Daily exams + semester + final exams
15	4	Explaining the electronic throttle control system in terms of components, features, malfunctions, and inspection methods	Electronic control system	Lecture + film screening + laboratory	Daily exams + semester + final exams

11 . Course development plan

- Continuously update the course content to keep pace with recent developments in automotive electronic control technologies, intelligent vehicle systems, hybrid and electric vehicles, and manufacturers' technical standards.
- Integrate modern teaching strategies by adopting interactive learning, problem-based learning, simulation-based instruction, blended learning, and case studies related to automotive electronic control systems.
- Enhance practical training through hands-on laboratory work using modern automotive diagnostic equipment, electronic control units (ECUs), sensors, actuators, oscilloscopes, scan tools, and automotive simulation systems.
- Expand laboratory facilities by developing advanced training panels and simulation modules that replicate real automotive electronic control systems for diagnosis, programming, testing, and troubleshooting.
- Diversify assessment methods by incorporating written examinations, practical laboratory tests, diagnostic projects, technical reports, presentations, oral examinations, and continuous classroom assessment.
- Promote independent learning by encouraging students to use manufacturers' service manuals, technical databases, scientific journals, online learning platforms, and professional automotive diagnostic software.
- Strengthen collaboration with industry through field visits, summer training, guest lectures, and partnerships with automotive service centers, dealerships, and vehicle manufacturers to expose students to current technologies and industrial practices.
- Conduct periodic reviews of the course based on feedback from students, faculty members, graduates, and industry stakeholders to ensure continuous improvement and alignment with program learning outcomes and labor market requirements.

12. Course Evaluation

No	Evaluation methods	Calendar appointment week	degree	Relative % weight
1	Midterm Exam 1(theoretical)	The seventh week	10	10
2	Midterm Exam 1(practical)	The seventh week	10	10
3	Midterm Exam 2(theoretical)	The twelfth week	10	10
4	Midterm Exam 2(practical)	The twelfth week	10	10
5	Coursework Marks	Coursework Marks	10	10
6	Final Coursework Mark	The final week (End of the course)	50	50
7	Final practical exam	Final semester exams	10	10
8	Final theoretical exam	Final semester exams	40	40
The Total		100	100%	100%

13 .Infrastructure

Classrooms, laboratories, and workshops	Available
Required prescribed textbooks	• Automotive Electronic Control Systems. • A comprehensive textbook covering the topics included in the course. • Lecture notes and instructional materials prepared by the course instructor.
Main References	• Adaptive Cruise Control". Wikispeedia. Retrieved 9 March 2015. • Automotive Electricity and Electronics – James D. Halderman.

	• Understanding Automotive Electronics – William B. Ribbens. • Bosch Automotive Handbook – Robert Bosch GmbH. • Advanced Automotive Fault Diagnosis – Tom Denton.
Recommended books and references (scientific journals, reports	• Scientific journals and conference proceedings in automotive electronics and intelligent vehicle systems. • Technical reports and manufacturers' service manuals. • Automotive diagnostic software documentation. • Books, periodicals, software applications, and modern websites related to automotive electronic control systems
Electronic references, Internet sites	• http://paaetwp.paaet.edu.kw/FutureMakers/?p=3766 • https://www.assayyarat.com/forums/t228671.html • http://paaetwp.paaet.edu.kw/FutureMakers/?p=3766 • SAE International: https://www.sae.org • Bosch Automotive Aftermarket: https://www.boschaftermarket.com • ScienceDirect: https://www.sciencedirect.com • SpringerLink: https://link.springer.com • IEEE Xplore Digital Library: https://ieeexplore.ieee.org

Course Description: **Automotive electronic control systems 2**

1. Course name	Automotive electronic control systems 2
2. code	PMTA213
3. Available attendance forms	My presence
4. Semester/year	Second year / Second semester
5. Date this description was prepared	5/5/2026
6. Number of study hours/ Units	60 hours / Units 4
7. Course Instructor Name	Lecturer / Jasim Ibrahim Musa jasim_hwj@ntu.edu.iq

8-Course objectives

- Develop students' fundamental knowledge of modern automotive technology, alongside the essential skills required to operate automotive diagnostic equipment and computer-based diagnostic systems.
- Enable students to identify and diagnose mechanical and electrical faults in modern vehicles using systematic diagnostic procedures.
- Equip students with the knowledge and practical skills necessary to use advanced diagnostic tools, computerized testing equipment, and modern technologies to detect, analyze, and repair faults in contemporary automotive systems.
- Develop students' understanding of the concepts, operation, and applications of complex electronic systems used in modern vehicles, including engine management systems, advanced braking systems, and other electronic control systems.
- Promote students' awareness of occupational health and safety standards by emphasizing safe working practices, proper handling of hazardous materials, and compliance with environmental protection requirements in the automotive industry.
- Prepare students to keep pace with technological advancements and innovations in the

automotive industry by introducing emerging technologies such as hybrid and electric vehicles, autonomous driving systems, artificial intelligence, and intelligent transportation technologies.

9- Course outcomes and teaching, learning and evaluation methods

A.Knowledge and Understanding

Upon successful completion of this course, students will be able to:

A1. Explain the principles, functions, and operating mechanisms of automotive electronic control systems and diagnostic equipment.

A2. Identify the procedures, testing methods, and operational requirements for automotive electronic control and diagnostic systems.

A3. Explain the operating principles and proper use of automotive electronic diagnostic and testing equipment.

A4. Describe the functions of sensors, actuators, electronic control units (ECUs), and in-vehicle communication systems.

B. Course-Specific Skills

Upon successful completion of this course, students will be able to:

B1. Perform inspection and diagnostic procedures for automotive electronic control systems using appropriate diagnostic equipment.

B2. Test, evaluate, and replace faulty electronic components and control system elements according to standard maintenance procedures.

B3. Operate modern automotive diagnostic tools and electronic testing equipment safely and effectively.

Teaching and Learning Methods

- Interactive theoretical lectures.
- Practical laboratory sessions.
- Educational videos and multimedia presentations.
- Graduation projects and practical assignments.
- Demonstrations using modern automotive diagnostic equipment.

Assessment Methods

- Oral examinations.
- Written examinations.
- Practical laboratory tests.
- Laboratory reports.
- Midterm examinations.
- Final written and practical examinations.
- Continuous classroom assessment.

C. Affective and Value-Based Objectives

Upon successful completion of this course, students will be able to:

C1. Appreciate the importance of modern electronic control systems in the development and performance of contemporary vehicles.

C2. Recognize the significance of using advanced electronic technologies to improve maintenance efficiency, optimize time and resources, and enhance vehicle performance.

C3. Demonstrate professional responsibility, safety awareness, and commitment to continuous learning in automotive electronic technologies.

Teaching and Learning Methods

- Theoretical lectures.
- Laboratory training.
- Graduation projects.
- Field visits to automotive manufacturing plants and service centers.
- Guided discussions and practical activities.

Assessment Methods

- Continuous observation of practical performance.
- Oral interviews.
- Cumulative records of student performance.
- Written examinations.
- Daily quizzes.
- Oral questioning.

D. General and Transferable Skills (Employability and Personal Development)

Upon successful completion of this course, students will be able to:

D1. Select and use appropriate diagnostic equipment, tools, and materials required for inspecting and servicing automotive electronic control systems.

D2. Inspect, test, and evaluate automotive electronic components and systems to determine their operational condition and serviceability.

D3. Develop technical problem-solving, communication, teamwork, and documentation skills required for professional practice in the automotive industry.

D4. Utilize modern automotive diagnostic technologies and technical resources to support lifelong learning and continuous professional development.

10. Course structure

the week	hours	Required learning outcomes	Name of the unit/topic	Teaching method	Evaluation method
1	4	Develop students' understanding of automotive suspension systems, including their components, operating principles, and the different types used in modern vehicles.	Suspension System: Principles, components, functions, and types of automotive suspension systems.	Lecture + film screening + laboratory	Daily exams + semester final + exams
2	4	Familiarize students with electronically controlled suspension systems, including their components, operating principles, and advantages.	Electronically Controlled Suspension System: Construction, operating principles, components, and advantages.	Lecture + film screening + laboratory	Daily exams + semester final + exams

3	4	Introduce students to magnetic suspension systems, including their components, operating principles, performance characteristics, and advantages.	Magnetic Suspension System: Components, operating principles, applications, and performance characteristics.	Lecture + film screening + laboratory	Daily exams + semester final + exams
4	4	Develop students' knowledge of air suspension systems, including their construction, operation, components, and engineering applications.	Air Suspension System: Components, operation, advantages, and maintenance considerations.	Lecture + film screening + laboratory	Daily exams + semester final + exams
5	4	Familiarize students with hydraulic suspension systems, their components, operating principles, and advantages in modern vehicles.	Hydropneumatic Suspension System: Construction, operating principles, components, advantages, and applications.	Lecture + film screening + laboratory	Daily exams + semester final + exams
6	4	Introduce students to active suspension systems, including their components, operating mechanisms, objectives, benefits, and practical applications.	Active Suspension System: Components, control strategies, operating principles, advantages, and applications.	Lecture + film screening + laboratory	Daily exams + semester final + exams
7	4	Develop students' understanding of automotive navigation systems, including vehicle positioning, route guidance, and location tracking technologies.	Automotive Navigation System: Principles of operation, components, route guidance, and vehicle positioning technologies.	Lecture + film screening + laboratory	Daily exams + semester final + exams

8	4	Familiarize students with Global Positioning System (GPS) applications in vehicles, including vehicle tracking, fleet management, fuel consumption optimization, and anti-theft systems.	GPS Applications in Transportation: Vehicle tracking, fleet management, route optimization, fuel management, and anti-theft applications.	Lecture + film screening + laboratory	Daily exams + semester final + exams
9	4	Develop students' knowledge of automotive airbag systems, including their components, operating principles, deployment conditions, and their role in occupant safety.	Airbag Inflation System: Components, operating principles, deployment sequence, and occupant protection.	Lecture + film screening + laboratory	Daily exams + semester final + exams
10	4	Introduce students to airbag sensors, including their functions, operating principles, and integration within vehicle safety systems.	Airbag Sensor System: Types of sensors, operating principles, signal processing, and integration with the airbag control unit.	Lecture + film screening + laboratory	Daily exams + semester final + exams
11	4	Develop students' understanding of advanced automotive electronic systems, including their operating principles, functions, benefits, and operating conditions.	Smart Lighting System: Components, operating principles, adaptive lighting technologies, and vehicle safety applications.	Lecture + film screening + laboratory	Daily exams + semester final + exams
12	4	Familiarize students with automatic parking systems, including front and rear parking assistance technologies and their operating principles.	Automatic Parking System: Front and rear parking assistance systems, operating principles, sensors, and control strategies.	Lecture + film screening + laboratory	Daily exams + semester final + exams
13	4	Introduce students to Tire Pressure Monitoring Systems (TPMS), including their components, operating principles, and importance	Tire Pressure Monitoring System (TPMS): Components, operating principles, fault detection, and safety benefits.	Lecture + film screening + laboratory	Daily exams + semester final + exams

		in vehicle safety.			
14	4	Develop students' understanding of hybrid and electric vehicles, including their principles of operation, applications, and advantages.	Electric and Hybrid Vehicles: Principles of operation, classifications, advantages, and challenges.	Lecture + film screening + laboratory	Daily exams + semester final + exams
15	4	Familiarize students with the components, electrical and electronic systems, and steering technologies used in hybrid and electric vehicles.	Components and Features of Electric and Hybrid Vehicles: Electric propulsion systems, battery technologies, power electronics, regenerative braking, electric steering systems, and major vehicle components.	Lecture + film screening + laboratory	Daily exams + semester final + exams

11 . Course development plan

- Continuously update the curriculum to align with the latest developments in the automotive industry, technological advancements, and labor market requirements through the Curriculum Development Committee and the Scientific Committee.
- Develop and introduce modern course content that reflects current industry needs, emerging automotive technologies, and professional competency standards.
- Organize scientific seminars, workshops, and conferences in collaboration with academic and industry experts to support curriculum development and incorporate recent advances in the field.
- Monitor scientific and technological developments in the area of specialization and integrate relevant innovations, standards, and best practices into the course content.
- Strengthen collaboration with industry by obtaining feedback from employers, automotive service centers, and manufacturers to ensure that the curriculum meets workforce demands.
- Conduct periodic curriculum reviews based on input from students, faculty members, graduates, and industry stakeholders to ensure continuous improvement and alignment with program learning outcomes.

12. Course Evaluation

No	Evaluation methods	Calendar appointment week	degree	Relative % weight
1	Midterm Exam 1(theoretical)	The seventh week	10	10
2	Midterm Exam 1(practical)	The seventh week	10	10
3	Midterm Exam 2(theoretical)	The twelfth week	10	10
4	Midterm Exam 2(practical)	The twelfth week	10	10
5	Coursework Marks	Coursework Marks	10	10
6	Final Coursework Mark	The final week (End of the course)	50	50
7	Final practical exam	Final semester exams	10	10
8	Final theoretical exam	Final semester exams	40	40
The Total		100	100%	100%

13.Infrastructure	
Classrooms, laboratories, and workshops	Available
Required prescribed textbooks	• Automotive Electronic Control Systems. • A comprehensive textbook covering the topics included in the course. • Lecture notes and instructional materials prepared by the course instructor.
Main References	• Adaptive Cruise Control". Wikispeedia. Retrieved 9 March 2015. • Automotive Electricity and Electronics – James D. Halderman. • Understanding Automotive Electronics – William B. Ribbens. • Bosch Automotive Handbook – Robert Bosch GmbH. • Advanced Automotive Fault Diagnosis – Tom Denton.
Recommended books and references (scientific journals, reports	• Scientific journals and conference proceedings in automotive electronics and intelligent vehicle systems. • Technical reports and manufacturers' service manuals. • Automotive diagnostic software documentation. • Books, periodicals, software applications, and modern websites related to automotive electronic control systems
Electronic references, Internet sites	• http://paaetwp.paaet.edu.kw/FutureMakers/?p=3766 • https://www.assayyarat.com/forums/t228671.html • http://paaetwp.paaet.edu.kw/FutureMakers/?p=3766 • SAE International: https://www.sae.org • Bosch Automotive Aftermarket: https://www.boschaftermarket.com • ScienceDirect: https://www.sciencedirect.com • SpringerLink: https://link.springer.com • IEEE Xplore Digital Library: https://ieeexplore.ieee.org